

GENERATION GENIUS MATH PRACTICE AND GENIUS CHALLENGES ANSWER KEYS

INTRO TO ADDITION

Extended Practice (Number Problems)

1. $2 + 3 = 5$
2. $3 + 5 = 8$
3. $4 + 5 = 9$ OR $5 + 4 = 9$

Extended Practice (Word Problems)

1. $4 + 5 = 9$
2. $3 + 7 = 10$
3. $6 + 2 = 8$

Genius Challenge

1. 3 and 1 make 4
2. $2 + 4 = 6$ OR $4 + 2 = 6$
3. $5 + 3 = 8$

ADD & SUBTRACT WITHIN 20

Extended Practice (Number Problems)

- | | |
|--------|-------|
| 1a. 17 | b. 15 |
| c. 11 | d. 17 |
| 2a. 6 | b. 7 |
| 3a. 4 | b. 9 |
| c. 8 | d. 13 |
| 4a. 2 | b. 15 |

Extended Practice (Word Problems)

- $13 + 5 = ?$
 $13 + 5 = 18$; Wynn has 18 apples in all.
- $9 + ? = 12$
 $9 + 3 = 12$; Aman put 3 fish in the tank.
- $16 - 5 = ?$
 $16 - 5 = 11$; Alex has 11 stamps left.
- $8 + 5 = ?$
 $8 + 5 = 13$; They have 13 marbles in all.
- $14 - ? = 6$
 $14 - 8 = 6$; Cam ate 8 strawberries.
- $? - 7 = 3$
 $10 - 7 = 3$; Tai had 10 blueberries to start.

Genius Challenge

- | | |
|--------|-------|
| 1a. 17 | b. 5 |
| c. 12 | d. 16 |
| e. 3 | f. 7 |
| g. 14 | h. 3 |
- $9 + 5 = ?$
 $9 + 5 = 14$; Akal has 14 flowers in all.
 - $? - 6 = 5$
 $11 - 6 = 5$; Kalani had 11 candies to start.

INTRO TO SUBTRACTION

Extended Practice (Number Problems)

1a. 2

c. 4

2a. 1

b. 5

c. 1

d. 7

b. 2

d. 2

Extended Practice (Word Problems)

1. 2 balls are left

2. 3 crackers are left

3. 6 kids

4. 3 dogs are left

Genius Challenge

1a. 1

2a. 4

b. 2

c. 6

d. 3

3. 2 ducks

b. 4

READ & WRITE NUMBERS TO 100

Extended Practice (Number Problems)

1.

1	2	3	4	5	6
10	11	12	13	14	15
33	34	35	36	37	38
55	56	57	59	59	60

2. 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

Extended Practice (Word Problems)

1. 6. 7. 8. 9. 10

11, 12, 13, 14, 15

16, 17, 18, 19, 20

21, 22, 23, 24, 25

26, 27, 28, 29, 30

31, 32, 33, 34, 35

36, 37, 38, 39, 40

Genius Challenge

1.






















1	2	3	4	5
15	16	17	18	19
47	48	49	50	51
71	72	73	74	75

2. 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

INTRO TO 2D SHAPES

Extended Practice (Number Problems)

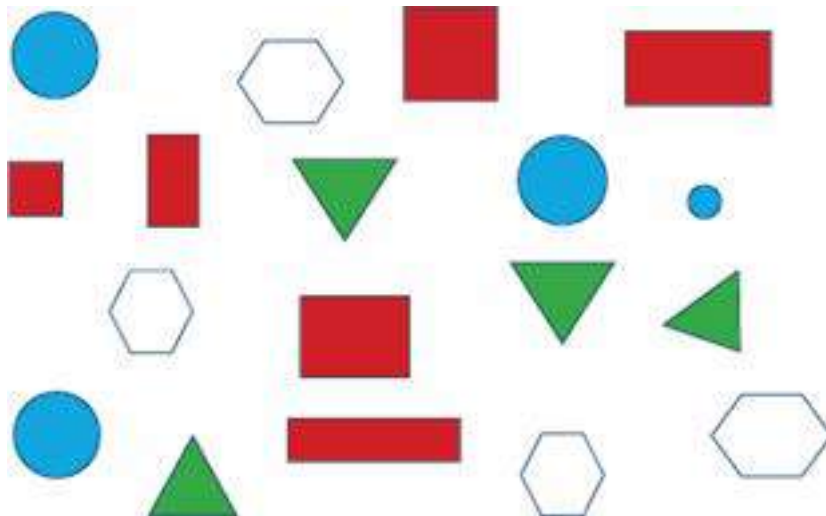
1.

square			
triangle			
circle			
rectangle			
hexagon			
circle			
triangle			

Extended Practice (Word Problems)







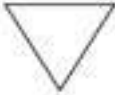








1. Square – 4 sides; triangle – 3 sides; hexagon – 6 sides; rectangle – 4 sides

2.



Genius Challenge

1.

square			
triangle			
circle			
rectangle			
hexagon			

2. Triangle – 3 sides; rectangle – 4 sides; hexagon – 6 sides; square – 4 sides

MENTAL MATH WITHIN 100

Extended Practice (Number Problems)

- 1a. 12
- c. 19
- 2a. 15
- 3a. 6
- 4a. 90
- c. 97
- e. 65

- b. 14
- d. 21
- b. 5
- b. 75
- b. 70
- d. 3
- f. 73

- c. 12
- c. 13

Extended Practice (Word Problems)

- 1. 23
- 2. 9
- 3. \$20
- 4. 56
- 5. 16

Genius Challenge

- 1a. 11
- c. 16
- e. 25
- 2a. 90
- c. 82
- e. 55
- 3. 46
- 4. 37

- b. 8
- d. 6
- f. 12
- b. 60
- d. 5
- f. 23

PARTITION SHAPES INTO EQUAL SHARES

Extended Practice (Number Problems)

For all drawing problems, answers will vary. One sample answer is shown.

1a.



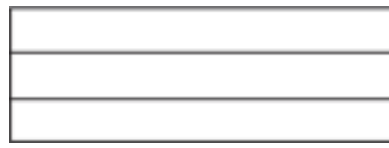
b.



2a.



b.



3a.



b.

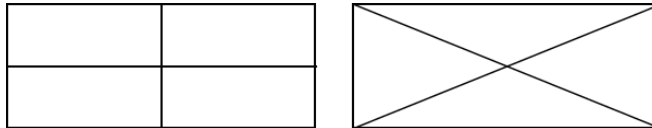


4. 2; 3

Extended Practice (Word Problems)

For all drawing problems, answers will vary. One sample answer is shown.

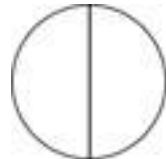
1.



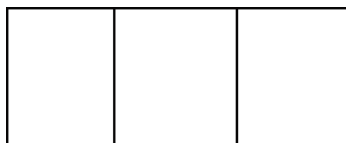
2.



3.

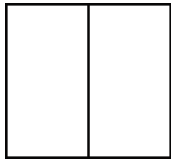


4.



Genius Challenge

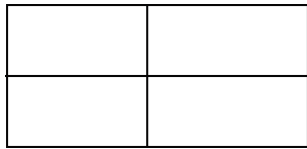
1a.



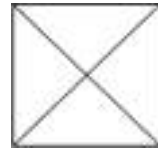
b.



2a.



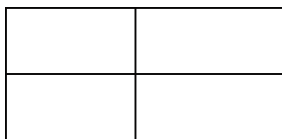
b.



3.



4.



INTRO TO EQUALITY (FIND A MISSING NUMBER)

Extended Practice (Number Problems)

- 1a. 8
- b. 7
- c. 2
- d. 5
- e. 6
- f. 6
- g. 4

Extended Practice (Word Problems)

- 1. $3 + 4 = 7$; $2 + 5 = 7$
- 2. $2 + 12 = 14$
- 3. $8 - 3 = 5$
- 4. $9 - 5 = 4$

Genius Challenge

- 1a. 2
- b. 7
- c. 7
- d. 6
- 2. $5 + 8 = 13$
- 3. $9 - 7 = 2$

PLACE VALUE: ONES, TENS & HUNDREDS

Extended Practice (Number Problems)

1. 2 hundreds flats, 6 tens rods, 5 ones cubes
2. 4 hundreds flats, 5 tens rods, 2 ones cubes
3. 403
4. 316
5. 500
6. 4 hundreds flats, 9 tens rods, 9 ones cubes
500

Extended Practice (Word Problems)

1. 50
2. 326
3. 5 hundreds flats, 3 ones cubes
4. 2
5. 249
6. 200

Genius Challenge

1. 1 hundreds flat, 2 tens rods, 5 ones cubes
2. 106
3. 337
4. 800
5. 3

ADD MORE THAN 2 NUMBERS

Extended Practice (Number Problems)

- | | |
|---------------|---------------|
| 1a. 19 | b. 20 |
| c. 68 | d. 77 |
| e. 60 | f. 67 |
| g. 436 | h. 650 |

Extended Practice (Word Problems)

- 18
- 46
- 38
- 70
- 79
- 679

Genius Challenge

- | | |
|---------------|---------------|
| 1a. 17 | b. 60 |
| c. 85 | d. 60 |
| e. 87 | f. 856 |
| 2. 25 | |
| 3. 57 | |

COMPARING 3-DIGIT NUMBERS

Extended Practice (Number Problems)

1. 961

2. 771

3a. < b. =

c. > d. <

e. < f. <

g. > h. >

Extended Practice (Word Problems)

1. <, Sadie

2. <, Wali

3. <, Zian

4. >, Mila

5. <, Jenny

Genius Challenge

1a. > b. >

c. = d. <

e. < f. <

2. >; Ava

3. >; Ben

4. >; Mila

MEASURE & ADD LENGTH (INTRO TO THE RULER)

Extended Practice (Number Problems)

1. 10
2. 4
- 3a. 6, 2
- b. top, 4 inches
- c. 8 inches

Extended Practice (Word Problems)

- 1a. 5 inches
- b. 3 inches
- c. pencil, 2 inches
- d. 8 inches
- 2a. more
- b. yellow, 11 feet
- c. 37 feet

Genius Challenge

1. 7 paper clips
- 2a. 3 inches, 4 inches
- b. bottom, 1 inch
- c. 7 inches
3. 8 feet

ADD & SUBTRACT WITHIN 100

Extended Practice (Number Problems)

1. $34 + 59 = 93$

2a. 59

b. 68

c. 63

d. 72

3a. 23

b. 25

c. 7

d. 38

Extended Practice (Word Problems)

1. 22

2. 57

3. 54

4. 82

5. 38

Genius Challenge

1a. 59

b. 97

c. 74

d. 43

2a. 43

b. 11

c. 7

d. 44

3. 38

4. 34

COMPOSING & DECOMPOSING NUMBERS (1-10)

Extended Practice (Number Problems)

1a. 2 and 4 make 6

b. 5 and 4 make 9

2a. answers will vary

b. answers will vary

2. 3, 2, 5 OR 1, 4, 5

Extended Practice (Word Problems)

$3 + 3 = 6$

$1 + 1 = 2$

$4 + 3 = 7$

$2 + 3 = 5$

$1 + 3 = 4$

$6 + 2 = 8$

$1 + 2 = 3$

$5 + 2 = 7$

$2 + 1 = 3$

$2 + 2 = 4$

$5 + 3 = 8$

$4 + 2 = 6$

$3 + 6 = 9$

$4 + 1 = 5$

$6 + 4 = 10$

Genius Challenge

1a. 5 and 3 make 8

b. 5 and 5 make 10

2. $3 + 3 = 6$

$1 + 3 = 4$

$5 + 2 = 7$

$1 + 2 = 3$

$4 + 1 = 5$

$6 + 4 = 10$

3. 5, 2, 7 OR 4, 3, 7

WRITE NUMBERS UP TO 20

Extended Practice (Number Problems)

1, 2, 3, 4, 5

6, 7, 8, 9, 10

11, 12, 13, 14, 15

16, 17, 18, 19, 20

Extended Practice (Word Problems)

1. 5

2. 12

3. 16

4. 9

5. 5

Genius Challenge

1. 6, 7, 8, 10

11, 12, 13, 14, 15

2. 20

3. 6

4. 13

COMPARING 2-DIGIT NUMBERS

Extended Practice (Number Problems)

- | | |
|-------|------|
| 1a. > | b. < |
| c. = | d. > |
| e. < | f. > |
| g. < | h. = |
| i. < | j. < |
| k. < | l. < |

Extended Practice (Word Problems)

1. >, Mari
2. <, Zevi
3. =
4. $16 < 26$

Genius Challenge

- | | |
|-------|------|
| 1a. > | b. < |
| c. = | d. > |
| e. < | f. > |
2. >, Rajan
 3. $58 < 72$

EVEN & ODD NUMBERS

Extended Practice (Number Problems)

- 1a. even
- 1b. odd
- 1c. odd
- 1d. even
- 1e. even
- 1f. even
- 2. $5 + 5 = 10$
- 3. $10 + 10 = 20$
- 4. $2 + 2 = 4$

Extended Practice (Word Problems)

- 1. odd
- 2. odd
- 3. even
- 4. $9 + 9 = 18$
- 5. $1 + 1 = 2$

Genius Challenge

- 1a. odd
- 1b. odd
- 1c. odd
- 1d. even
- 1e. odd
- 1f. even
- 2. $6 + 6 = 12$
- 3. $9 + 9 = 18$
- 4. $7 + 7 = 14$

NUMBERS IN EXPANDED & WORD FORM (3-DIGIT NUMBERS)

Extended Practice (Number Problems)

- 1a. $600 + 40 + 9$ b. $100 + 60 + 7$
c. $700 + 9$ d. $400 + 30$
- 2a. eight hundred ninety-one
b. six hundred, fifteen
c. three hundred four
d. one hundred eighty
3. $300 + 60 + 1$; three hundred sixty one
4. $700 + 20 + 5$

Extended Practice (Word Problems)

- $900 + 50$; nine hundred fifty
- $200 + 10 + 9$; two hundred nineteen
- $700 + 9$; seven hundred nine
- $300 + 60 + 5$; three hundred sixty five
- Yes, $500 + 80 + 3$ and 583 both should 5 hundreds, 8 tens, and 3 ones.
- No, six hundred two is 602 which is not equal to 620.
- Yes. $700 + 10 + 6 = 716$. Seven hundred sixteen = 716.

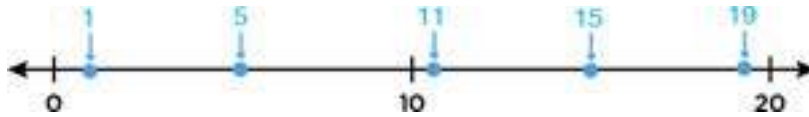
Genius Challenge

- 1a. $400 + 30 + 2$ b. $600 + 7$
c. $900 + 90$ d. $100 + 80 + 1$
- 2a. six hundred eight four
b. four hundred ten
c. six hundred one
3. $200 + 70 + 5$; two hundred seventy five
4. No. $300 + 30 + 3 = 333$. Three hundred thirty = 330.

INTRO TO THE NUMBER LINE

Extended Practice (Number Problems)

1.



2. 75

3a. Answers will vary. Students should start at 5 and add a total of 5; 10

b. Answers will vary. Students may start at 21 and jump a total of 13, or start at 13 and jump a total of 21; 34

4. 6

5. Answers will vary. Students may start at 156 then make jumps of 10 to 236, or make a jump of 50 to 206 then a jump of 30 to 236.

Extended Practice (Word Problems)

1. 7

2. 390

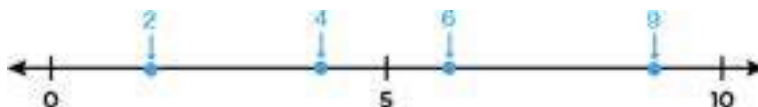
3. 14

4. 64

5. 35

Genius Challenge

1.



2. Answers will vary. Sum is 25.

3. Answers will vary. Difference is 19.

4. Answers will vary. Sum is 86.

5. Answers will vary. Difference is 263.

SKIP COUNTING (2S, 5S, 10S & 100S)

Extended Practice (Number Problems)

1a. 4, 6, 8, 10

c. 72, 74, 76, 78

2a. 10, 15, 20, 25

c. 35, 40, 45, 50

3a. 20, 30, 40, 50

4a. 200, 300, 400, 500

b. 38, 40, 42, 44

d. 20, 22, 24, 26

b. 70, 75, 80, 85

d. 85, 90, 95, 100

b. 90, 100, 110, 1120

b. 600, 700, 800, 900

Extended Practice (Word Problems)

1. 5, 10, 15, 20, 25

2. 10, 20, 30, 40

3. 100, 200, 300, 400, 500

4. 22, 24, 26, 28

5. 45, 50, 55, 60

Genius Challenge

1a. 6, 8, 10, 12

2a. 55, 60, 65, 70

3a. 30, 40, 50, 60

4a. 300, 400, 500, 600

5. 100, 200, 300

6. 38, 40, 42, 44

b. 30, 32, 34, 36

b. 30, 35, 40, 45

b. 100, 110, 120, 130

b. 500, 600, 700, 800

INTRO TO MEASUREMENTS: WEIGHT & LENGTH

Extended Practice (Number Problems)

- | | |
|------------------------|------------------------|
| 1a. Pencil 2 | b. Pencil 1 |
| 2a. Pencil 2 | b. Pencil 1 |
| 3a. Tree 1 | b. Tree 2 |
| 4a. Basketball | b. Bowling ball |
| 5a. Number cube | b. Present |

Extended Practice (Word Problems)

- | | |
|--|--|
| 1a. Answers will vary; total line length should be shorter than the given line. | b. Answers will vary; total line length should be longer than the given line. |
| 2. Grape | |
| 3. Answers will vary; total line length should be shorter than the given line. | |
| 4. The pink baby shoe is the shortest. The long men's loafer is the longest. | |

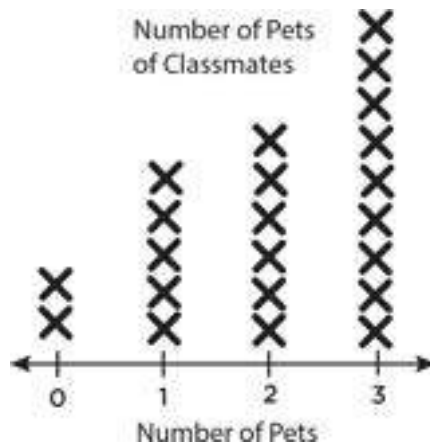
Genius Challenge

- | | |
|--|--------------------|
| 1a. Pencil 2 | b. Pencil 1 |
| 2. Answers will vary; line length should be longer than the short blue line but shorter than the long green line. | |
| 3. Answers will vary; the pole should be taller than the basketball but shorter than the tree. | |
| 4. Circle the bowling ball. X the tennis ball. | |

INTRO TO DATA: LINE PLOTS

Extended Practice (Number Problems)

1.



2a. 9 aliens

b. 95 cm

c. 99 cm

3a. 3 dolls

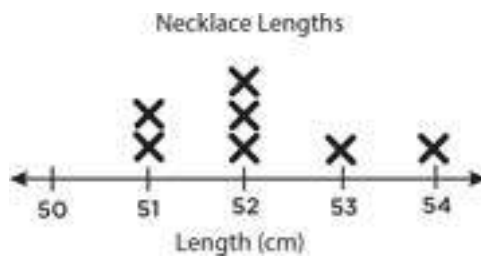
b. 11 dolls

c. 4 cm

d. 14 dolls

Extended Practice (Word Problems)

1.

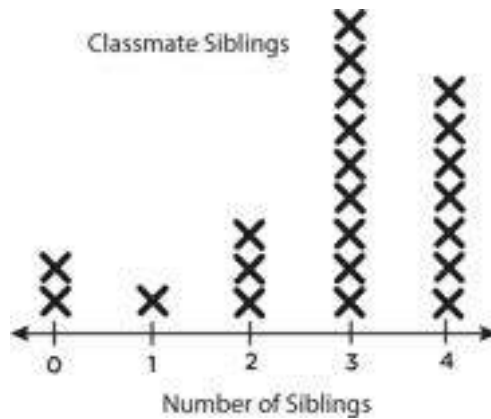


1b. 52 cm

c. 3 cm

d. 2 friends

2.



2a. 15 students

b. 3 students

c. 22 students

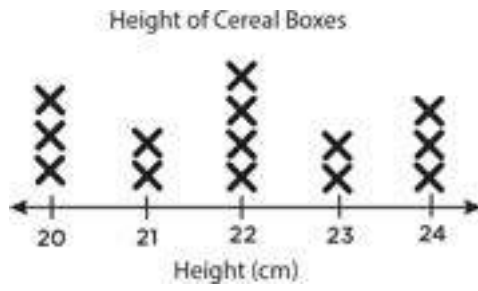
Genius Challenge

1a. 7 turtles

b. 2 turtles

c. No turtles

2a.



2b. 5 boxes

c. 22 cm, 4 boxes

d. 9 boxes

INTRO TO DATA: PICTOGRAPHS & BAR GRAPHS

Extended Practice (Number Problems)

1a. Cricket

b. Basketball

c. 4 people

2a.

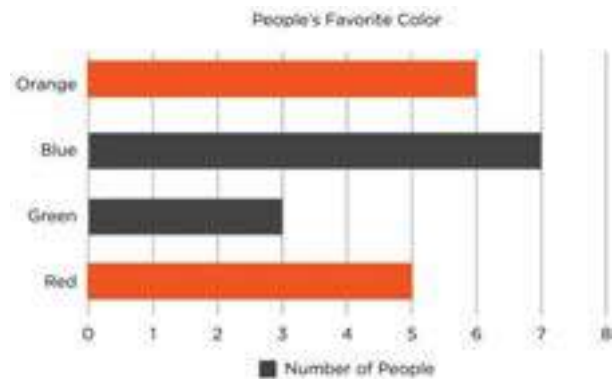


b. Sample answer: The most popular type of juice is orange juice. The least favorite juice is grape juice. 16 people answered the question.

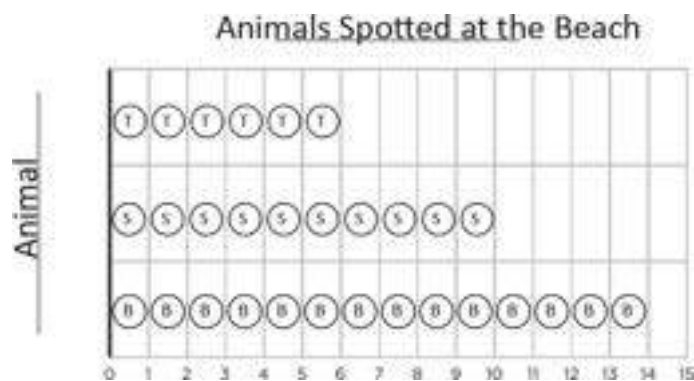
Extended Practice (Word Problems)

1.

Color	Tally Marks	Count
Red		5
Green		3
Blue		7
Orange		6



2.



Genius Challenge

1a.

Color	# of Balloons
Red	5
Blue	6
Black	2

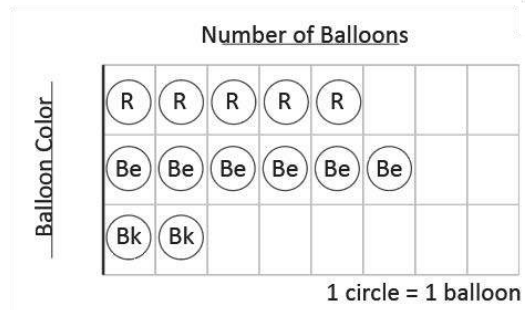
1b. blue

2a. Eight people have dogs.

2b. There are 4 more people who have fish than people who have dogs.

2c. 4 people have no pets.

2d. 17 people have either a cat or dog.



1c. 11

INTO TO REGROUPING (WHEN ADDING & SUBTRACTING)

Extended Practice (Number Problems)

- | | |
|----------------------|----------------------|
| 1a. 5 tens | b. 6 tens and 3 ones |
| c. 4 tens and 9 ones | d. 8 tens and 3 ones |
| 2a. 51 | b. 54 |
| c. 78 | d. 83 |
| e. 61 | f. 92 |
| 3a. 12 | b. 24 |
| c. 58 | d. 15 |
| e. 38 | f. 9 |

Extended Practice (Word Problems)

1. $25 + 29 = 54$ lollipops
2. $15 + 38 = 53$ minutes
3. $42 - 13 = 29$ tomatoes
4. $43 - 27 = \$16$
5. $60 - 33 = 27$ years

Genius Challenge

- | | |
|---------------------------|-------|
| 1a. 34 | b. 77 |
| c. 93 | d. 83 |
| 2a. 8 | b. 56 |
| c. 16 | d. 37 |
| 3. $37 + 53 = 90$ flowers | |
| 4. $84 - 67 = 17$ points | |

PLACE VALUE: ONES & TENS

Extended Practice (Number Problems)

- 1a.** 2 tens blocks and 9 ones blocks **b.** 4 tens blocks and 3 ones blocks
- 2a.** 53 **b.** 38
- 3a.** 60 (6 tens) **b.** 8 (8 ones) **c.** 40 (4 tens)
- 4a.** 54 **b.** 77 **c.** 90

Extended Practice (Word Problems)

- 70 (7 tens)
- 4 boxes
- 46 stickers
- Answers will vary; students may draw 5 groups of 10 stickers.
- 50 stamps
- 90 marbles

Genius Challenge

- 1a.** 3 tens blocks and 8 ones blocks **b.** 5 tens blocks and 1 one blocks
- 2a.** 42 **b.** 89
- 3a.** 9 (9 ones) **b.** 70 (7 tens) **c.** 3 (3 ones)
- 4.** 40 marbles

STRATEGIES TO ADD & SUBTRACT WITHIN 20 (MAKE A 10 & DOUBLES FACTS)

Extended Practice (Number Problems)

1a. $4 + 6 + 2 = 10 + 2 = 12$

c. $5 + 5 + 1 = 10 + 1 = 11$

2a. $5 + 5 = 10$; $10 + 1 = 11$

c. $8 + 8 = 16$; $16 + 1 = 17$

3a. 11

c. 11

4a. $17 - 7 = 10$; $10 - 1 = 9$

c. $15 - 5 = 10$; $10 - 1 = 9$

5a. 7

c. 9

b. $6 + 4 + 3 = 10 + 3 = 13$

d. $8 + 2 + 1 = 10 + 1 = 11$

b. $5 + 5 = 10$; $10 + 2 = 12$

d. $7 + 7 = 14$; $14 + 2 = 16$

b. 13

d. 13

b. $14 - 4 = 10$; $10 - 5 = 5$

d. $12 - 2 = 10$; $10 - 1 = 9$

b. 7

d. 9

Extended Practice (Word Problems)

1. 9 goldfish
2. 14 toy cars
3. 11 balls
4. 9 apples left
5. 14 plants in all

Genius Challenge

1a. 11

c. 12

2a. 3

c. 8

3. 12 cards

4. 17 tickets

5. 13 cards

b. 12

d. 14

b. 8

d. 8

INTRO TO COUNTING IN GROUPS (ARRAYS)

Extended Practice (Number Problems)

- 1a. $2 + 2 + 2 = 6$; $3 + 3 = 6$
- b. $5 + 5 = 10$; $2 + 2 + 2 + 2 + 2 = 10$
- c. $3 + 3 + 3 + 3 = 12$; $4 + 4 + 4 = 12$
- d. $5 + 5 = 10$; $2 + 2 + 2 + 2 + 2 = 10$
- e. $3 + 3 + 3 = 9$

Extended Practice (Word Problems)

- 1. $3 + 3 + 3 + 3 = 12$; 12 cookies in all
- 2. $4 + 4 = 8$; 8 stamps in all
- 3. $5 + 5 + 5 = 15$; 15 apples in all
- 4. $4 + 4 + 4 + 4 = 16$; 16 pennies in all
- 5. $3 + 3 + 3 + 3 + 3 = 15$; 15 dimes in all

Genius Challenge

- 1a. $2 + 2 = 4$
- b. $4 + 4 + 4 + 4 + 4 = 20$
- c. $5 + 5 + 5 = 15$
- 2. $2 + 2 + 2 + 2 = 8$; 8 marbles in total
- 3. $3 + 3 + 3 = 9$; 9 cookies in total

IDENTIFY & DRAW SHAPES BY ATTRIBUTES

Extended Practice (Number Problems)

1.

R	T	S	C	S
C	R	H	T	S
S		C	H	T
T	C	H	R	R

Extended Practice (Word Problems)

- 1a. Drawings will vary; triangle
 - b. Drawings will vary; square
 - c. Drawings will vary; hexagon
 - d. Drawings will vary; rectangle
 - e. Drawings will vary; circle
2. Shapes 1, 2, and 4

Genius Challenge

- 1a. Drawings will vary; triangle
 - b. Drawings will vary; rectangle
 - c. Drawings will vary; circle
 - d. Drawings will vary; square
2. Triangle – 3 sides; Square – All sides the same length; Circle – Round; Rectangle – 4 sides

CLASSIFY OBJECTS BY ATTRIBUTE (COLOR, SIZE & SHAPE)

Extended Practice (Number Problems)

1. 6 baseballs, 4 basketballs

Extended Practice (Word Problems)

- 1a. Group 2
- b. Group 1
2. 4 triangles, 5 squares

Genius Challenge

1. Answers will vary. Students may sort by shape (4 circles, 6 squares) or by color (6 blue, 4 pink).

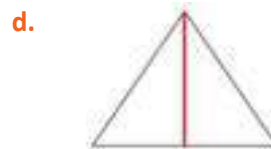
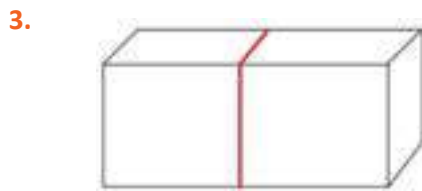
CREATE NEW SHAPES FROM EXISTING ONES

Extended Practice (Number Problems)

- 1a. Answers will vary. Students may use two squares, multiple rectangles, or triangles.
 - b. Answers will vary. Students may divide the triangle into 2 or more triangles.
 - c. Answers will vary. Students may divide the circle into two semi-circles.
 - d. Answers will vary. Students may divide the hexagon into squares/rectangles and triangles.
2. Answers will vary. Students may divide the rectangular prism into two cubes or two right triangular prisms.

Extended Practice (Word Problems)

1. Answers will vary. Students may divide the hexagons into squares/rectangles and triangles.



Genius Challenge

- 1a. Answers will vary. Students may use two squares, multiple rectangles, or triangles.
- b. Answers will vary. Students may divide the triangle into 2 or more triangles.



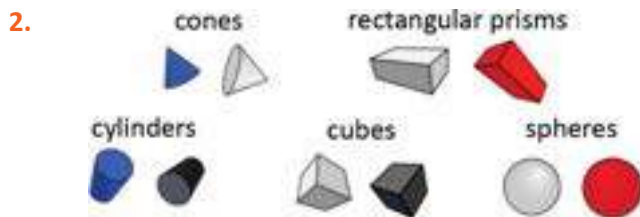
3. Figures 1 and 4

4. 6

INTRO TO 3D SHAPES

Extended Practice (Number Problems)

1. Sphere – figure 4
Cone – figure 3
Cylinder – figure 5
Cube – figure 2
Rectangular prism – figure 1



Extended Practice (Word Problems)



Genius Challenge

1. Row 1: Figures 1, 3
Row 2: Figures 3, 4
Row 3: Figures 1, 2
- 2a. 1, 3
- b. 1, 4
- c. 2, 3
- d. 2, 3

TELL TIME (NEAREST HALF HOUR)

Extended Practice (Number Problems)

1a. hour hand

b. minute hand

2. Circle clocks 4 and 6. X clocks 1 and 2.

Extended Practice (Word Problems)

1. Minute hand pointing to 6

2. Hour hand pointing to 8

3. 9: 30

4.



Genius Challenge

1a. minute hand

b. hour hand

2. Minute hand pointing to 12.

3. Hour hand pointing to 5.

4. 11:30

INTRO TO COUNTING OBJECTS

Extended Practice (Number Problems)

- | | | |
|--------------|--------------|--------------|
| 1a. 4 | b. 13 | c. 3 |
| d. 4 | e. 5 | f. 16 |
| g. 7 | h. 14 | i. 20 |
2. Check student object arrangements.
 3. Check student object arrangements.

Extended Practice (Word Problems)

1. Students should have moved 4 objects to the side.
 2. Students should have counted in 1 more object into the pile.
 3. Students should have counted out a group of 11 from the arranged objects.
- | | |
|---------------|--------------|
| 4a. 13 | b. 13 |
|---------------|--------------|

Genius Challenge

- | | | |
|--------------|--------------|-------------|
| 1a. 5 | b. 3 | c. 8 |
| d. 16 | e. 16 | |
2. Check student object arrangements.
- | | |
|---------------|--------------|
| 3a. 11 | b. 11 |
|---------------|--------------|

MONEY: COMBINATIONS OF BILLS & COINS

Extended Practice (Number Problems)

- 1a.** 68 cents
- b.** 68 cents
- c.** 68 cents
- d.** 68 cents
- 2.** Sample answer: C because it has the smallest number of coins.
- 3a.** 1 quarter, 1 nickel
- b.** 1 quarter, 2 dimes
- c.** 2 quarters, 4 pennies
- d.** 3 quarters, 2 dimes
- 4a.** 1 dollar bill, 1 quarter, 1 dime
- b.** 4 dollar bills, 2 quarters, 2 pennies
- c.** 3 dollar bills, 1 nickel, 2 pennies
- 5a.** 1 dollar bill, 3 quarters, 1 nickel, 1 penny
- b.** 4 dollar bills, 1 quarter, 1 dime, 4 pennies
- c.** 3 dollar bills, 3 quarters, 1 dime, 1 nickel, 2 pennies
- d.** 2 dollar bills, 1 quarter, 1 dime, 1 nickel, 4 pennies

Extended Practice (Word Problems)

- 1.** Sophie has \$2.38 and Anna has \$2.64, so Anna can buy the popcorn.
- 2.** 3 dollar bills, 3 quarters, 1 nickel, and 1 penny
- 3.** 2 dollar bills, 2 quarters, 1 dime, 1 nickel, and 2 pennies
- 4.** 5 dollar bills, 3 quarters, 1 dime, 1 nickel, and 3 pennies
- 5a.** $175 \text{ cents} + 110 \text{ cents} + 60 \text{ cents} + 53 \text{ cents} = \3.98
- b.** 3 dollar bills, 3 quarters, 2 dimes, and 3 pennies

Genius Challenge

- 1a. 64 cents
 - c. 18 cents
 - 2a. 1 dime, 2 pennies
 - c. 1 quarter, 1 nickel, 3 pennies
 - 3a. 2 dollar bills, 3 quarters, 1 nickel
 - c. 1 dollar bill, 1 quarter, 4 pennies
 - 4. 4 dollar bills, 2 quarters, 1 nickel, and 2 pennies
 - 5. 4 dollar bills, 5 dimes, 1 nickel, and 2 pennies
- b. 37 cents
 - d. 84 cents
 - b. 1 dime, 1 nickel, 4 pennies
 - d. 3 quarters, 1 nickel, 3 pennies
 - b. 3 dollar bills, 3 quarters, 2 dimes, 4 pennies
 - d. 5 dollar bills, 2 quarters, 1 dime, 1 nickel, 1 penny

MULTIPLYING FRACTIONS BY WHOLE NUMBERS

Extended Practice (Number Problems)

1a. $2 \times \frac{1}{3}$

b. $6 \times \frac{1}{5}$

2a. $\frac{4}{7}$

b. $\frac{6}{10}$ or $\frac{3}{5}$

c. $\frac{10}{12}$ or $\frac{5}{6}$

3a. $2\frac{1}{2}$

b. 6

c. $5\frac{3}{5}$

d. $4\frac{1}{5}$

e. 2

f. $10\frac{1}{2}$

4a. 4

b. 2

c. 7

Extended Practice (Word Problems)

1. 2 pans

2. 16 pounds

3. $2\frac{1}{2}$ days

4. She is not correct. She multiplied both the numerator and denominator of the fraction by 6. She should have multiplied only the numerator by 6 and kept 2 as the denominator.

Genius Challenge

1a. $\frac{3}{7}$

b. $\frac{1}{2}$

c. 3

d. $6\frac{2}{3}$

e. $1\frac{3}{4}$

f. $6\frac{1}{4}$

2a. 6

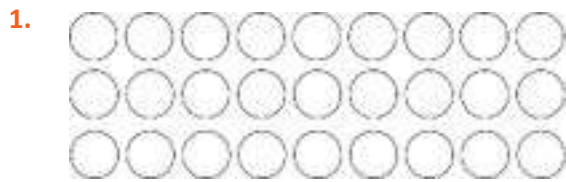
b. 5

3. 5 cups

4. $2\frac{1}{4}$ pounds

INTRO TO MULTIPLICATION

Extended Practice (Number Problems)



3. 5×8

4. 1×7

5a. 21

b. 45

c. 54

d. 0

Extended Practice (Word Problems)

1. 8×6 ; 48 photos

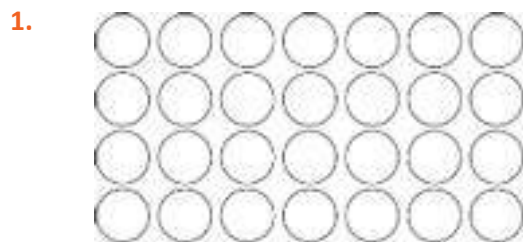
2. 7×2 ; 14 batteries

3. 7×5 ; 35 stars

4. 9×2 ; 18 cups

5. 5×4 ; 20 students

Genius Challenge



2. 3×5

3. 12

4. 72

5. 8×4 ; 32 stars

6. 7×6 ; 42 legs

INTRO TO DIVISION

Extended Practice (Number Problems)

- | | | |
|---------|--------|------|
| 1a. 3 | b. 6 | c. 7 |
| 2a. 3;3 | b. 7;7 | |
| c. 8;8 | d. 6;6 | |
| 3a. 5 | b. 6 | |
| c. 6 | d. 9 | |

Extended Practice (Word Problems)

- 7 perogies
- No. Each friend should get the same number of cookies. She gave some friends 5, 6, and 7.
- $5 \times 9 = 45$, therefore $45 \div 5 = 9$; Each friend gets 9 stickers.
- $48 \div 4 = 12$; There are 12 seeds in each row.
- $33 \div 11 = 3$; Each friend gets 3 cups of fruit drink.

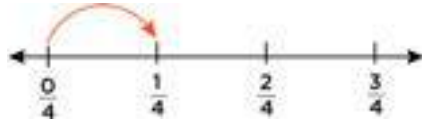
Genius Challenge

- 3
- $18 \div 3 = 6$; $18 \div 6 = 3$
- | | |
|-------|------|
| 3a. 3 | b. 2 |
| c. 6 | d. 8 |
- $24 \div 6 = 4$; Each friend gets 4 scoops of ice cream.
- $42 \div 6 = 7$; Miranda's grandma can knit 7 sweaters.

INTRO TO FRACTIONS USING THE NUMBER LINE

Extended Practice (Number Problems)

1.



2a. $\frac{4}{6}$

b. $\frac{3}{4}$

3.

Fraction	Numerator	Denominator
$\frac{3}{4}$	3	4
$\frac{7}{8}$	7	8
$\frac{2}{3}$	2	3
$\frac{3}{6}$	3	6

4. The labels will be $\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}, \frac{6}{8}$ and $\frac{7}{8}$.

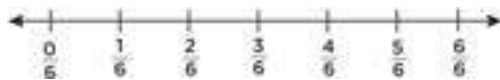
Extended Practice (Word Problems)

1.

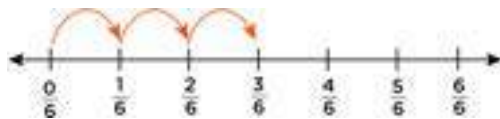


2. I agree with Venkatesh. Venkatesh's number line is partitioned into six pieces, and three of those are included in the fraction. Three is half of six, so this is an equivalent fraction to $\frac{1}{2}$.

3.



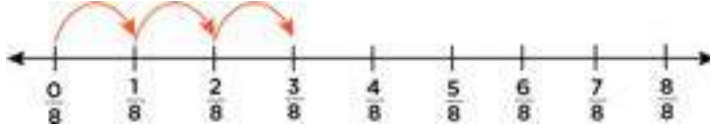
4.



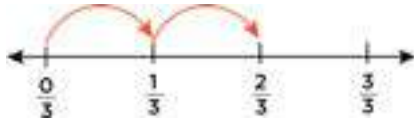
5. Jordan is not correct. 8 and 6 are both in the denominator, which means they represent the number of pieces the whole is partitioned into. If you partition something into more parts, each individual part is smaller. So, $\frac{5}{6}$ is larger than $\frac{5}{8}$.

Genius Challenge

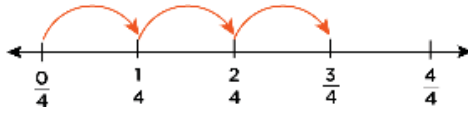
1a.



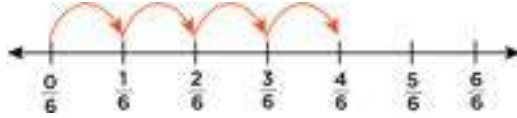
b.



c.



d.



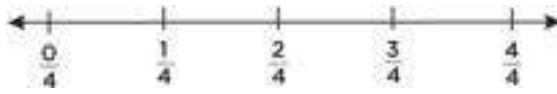
2a. $\frac{1}{2}$

b. $\frac{5}{6}$

c. $\frac{1}{4}$

d. $\frac{3}{6}$

3.



TELL TIME (NEAREST MINUTE)

Extended Practice (Number Problems)

1a. 2:35

2a. Minute hand at 10.

3a. 9:18

4a. Minute hand pointing 2 tick marks after 6

b. 9:03

b. Minute hand at 4.

b. 1:41

b. Minute hand pointing 4 tick marks after 2

Extended Practice (Word Problems)

1. 8:15 am

2. Minute hand pointing to the 10

3. 4:37 pm

4. Minute hand pointing to 2 tick marks after 4

Genius Challenge

1a. 7:40

2a. Minute hand pointing to the 11

3. Minute hand pointing to 2 tick marks after the 10; hour hand pointing to just before 12

b. 12:07

b. Minute hand pointing to 3 tick marks after 7

MEASURE ELAPSED TIME

Extended Practice (Number Problems)

- 1a. 1 hour
- 2a. 1 hour and 8 minutes
- 3a. 6:35 p.m.
- 4a. 6:43 a.m.
- b. 3 hours and 30 minutes
- b. 1 hour and 38 minutes
- b. 4:55 p.m.
- b. 11:05 a.m.

Extended Practice (Word Problems)

- 1. 5:18 p.m.
- 2. 1 hour and 17 minutes
- 3. 6:24 p.m.
- 4. $3\frac{1}{2}$ hours or 3 hours and 30 minutes
- 5. 11:26 a.m.

Genius Challenge

- 1a. $7\frac{1}{2}$ hours or 7 hours and 30 minutes
- 2a. 8:15 p.m.
- 3a. 8:15 p.m.
- 4. 1 hour and 15 minutes
- 5. 5:45 p.m.
- b. 3 hours and 24 minutes
- b. 11:30 a.m.
- b. 6:50 a.m.

IDENTIFY NUMBER PATTERNS (IN ARITHMETIC AND THE MULTIPLICATION TABLE)

Extended Practice (Number Problems)

- | | |
|---------|---------|
| 1a. odd | b. even |
| c. even | d. odd |
| e. even | f. odd |
- 2a. yes
- b. yes
- c. yes
- d. yes
- 3a. odd
- b. even
- c. even
- d. odd

4. No. When we round, we usually round each number to a multiple of 10, 100, or 1,000. Since multiples of 10, 100, or 1,000 are all even, multiplying them together always gives us an even number. So, that doesn't help us to check if the result of multiplying two numbers is even or odd.

- 5a. 2
- b. 5
- c. 5
- d. 2, 5, 10
- e. 2

Extended Practice (Word Problems)

1. No. An odd number added to an even number makes an odd number, which cannot be shared evenly among two people.
2. No. An even number minus an odd number is odd. Therefore, there is one unpaired drum stick left.
3. Even, because $\text{even} \times \text{odd} = \text{even}$.
4. Odd plus odd makes even. Then if we add even to even, we again have an even number. The sum of all their money is even.
5. If we multiply chocolate chips by students, we are multiplying odd by even, and the product is even. Then we multiply the product by the number of classes, we are multiplying even by odd, which is still even. Therefore, John needs an even number of chocolate chips.

Genius Challenge

1a. odd

c. even

e. even

2a. odd

c. even

3a. 550, 9,994, 10,006

b. 65, 120, 2,000

c. 70, 440, 68,680

4. Yes. Even minus even equals even.

b. even

d. even

f. odd

b. even

d. even

ADD & SUBTRACT WITHIN 1,000

Extended Practice (Number Problems)

1a. $700 + 60 + 9 = 769$

b. $300 + 20 + 2 = 322$

2a. $800 + 80 + 9 = 889$

b. $300 + 40 + 4 = 344$

3a. $700 + 80 + 15 = 795$

b. $100 + 70 + 6 = 176$

4. $124 + 300 = 424$; $424 + 70 = 494$; $494 + 6 = 500$.

5. $672 - 400 = 272$; $272 - 40 = 232$; $232 - 5 = 227$

6a. $600 + 345 = 945$

b. **Sample answer:** $267 + 400 = 667$

c. $535 - 300 = 235$

d. **Sample answer:** $486 - 299 = 487 - 300 = 18$

Extended Practice (Word Problems)

- Responses will vary. Sample response: I could write each number by its place value, then add the same places. If any place was more than 10, I would regroup it as 1 of the next place.
- Responses will vary. Sample response: I could change 700 to $600 + 90 + 10$ so that I can subtract the tens and ones. I would write 348 by its place value and then subtract each place. Or, I could count up from 348 to 500; first by ones (add 2), then tens (add 50), then hundreds (add 300).
- $239 + 683 = 922$ Robert has 922 baseball cards in his collection.
- $973 - 582 = 391$ Julia has 391 steps left to get to the cafeteria.
- When Frank added the ones, which would be 15, he did not regroup. There should be 5 ones, with the 10 regrouped as 1 ten. The total could not be over 1,000 (or 7,000!) since $300 + 400 = 700$.

Genius Challenge

1a. 799

b. 226

c. 893

d. 282

e. 831

f. 379

2a. 770

b. 675

c. 451

d. 558

3. $786 - 368 = 418$ Andy has 418 more miles to drive.

MEASURE MASS & VOLUME (METRIC SYSTEM)

Extended Practice (Number Problems)

1. 8 g
2. 40 L
3. 560 kg
4. 112 mL
5. 48 L
6. 5 g
7. 800 mL
8. 161 kg
9. 42 L
10. 9 g
11. 173 mL
12. 488 kg

Extended Practice (Word Problems)

1. $36 \div 9 = 4$; 1 slice of turkey weighs 4 grams.
2. $35 - 22 = 13$; Cub 2 weighs 13 kilograms more than Cub 1.
3. 10×9 ; The total mass of the tower is 90 grams.
4. $230 + 150 = 380$; Alma drinks 380 milliliters of juice in all.
5. $2 \times 8 = 16$; Jason buys 16 liters of soda in all.

Genius Challenge

1. 6 g
2. 80 L
3. 360 kg
4. 42 mL
5. 28 L
6. 8 g
7. 870 mL
8. 33 kg
9. $200 + 250 = 450$; Ezria has 450 mL of water in all.
10. $6 \times 4 = 24$; Caleb's dog weighs 24 kilograms.

INTRODUCTION TO PERIMETER

Extended Practice (Number Problems)

1a. 72 cm

b. 54 m

2a. 35 m

b. 73 cm

3. a. $11\text{ m} + 11\text{ m} + 11\text{ m} + 11\text{ m} = 44\text{ m}$ b. $4 \times 11\text{ m} = 44\text{ m}$

4. 40 m

Extended Practice (Word Problems)

1. Possible answer: 15 m, 15 m, 30 m, 30 m

2. Square

3. $7\text{ m} + 5\text{ m} + 7\text{ m} + 5\text{ m} = 24\text{ m}$ of fence

4. Drawings will vary: one possible answer is a rectangle with two long sides labeled 5 m, and the top and bottom short sides labeled 3 m.

Genius Challenge

1a. 595 cm

b. 188 m

c. 330 m

d. 451 cm

2. 28 m

3. Drawings may vary; Students should draw a 5-sided shape, with each side labeled 60 m.

INTRO TO FINDING AREA

Extended Practice (Number Problems)

- 1a. 15 square units
- 2a. 18 square centimeters
- c. 16 square inches
- 3a. 48 square feet
- b. 16 square units
- b. 9 square feet
- d. 20 square meters
- b. 9 square inches

Extended Practice (Word Problems)

1. Possible answer: You fill the shape with square units without having any gaps between the units or any unit overlapping. Then you count how many square units it takes to fill the shape. The area is the number of square units it takes to fill the shape.
2. 10 square yards
3. 15
4. 600 square feet
5. Possible decomposition shown; $9 + 42 + 84 = 135$ square meters

Genius Challenge

- 1a. 6 square units
- c. 9 square meters
- 2. 108 square feet
- 3. No; Possible explanation: The shape of the kitchen can be decomposed into 3 rectangles that are $3 \times 8 = 24$ square feet, $4 \times 5 = 20$ square feet, and $2 \times 6 = 12$ square feet. So, Ian needs $24 + 20 + 12 = 56$ of the one-foot square tiles.
- b. 14 square units
- d. 42 square inches

DIVISION USING PARTIAL QUOTIENTS (THE BIG 7 MODEL)

Extended Practice (Number Problems)

1. 69

2a. 14

b. 34 R4

c. 65

d. 45

e. 179 R3

f. 151 R10

Extended Practice (Word Problems)

1. $134 \div 4 = 33 \text{ R } 2$; She can put 33 favors on each table and have 2 favors left over.
2. $645 \div 15 = 43$; Terrence biked 43 kilometers each day.
3. $1,281 \div 3 = 427$; Each charity receives \$427.
4. $2,486 \div 12 = 207 \text{ R } 2$; All 12 trucks could have 207 kilograms of strawberries, but there would be 2 kilograms left. So, 11 trucks could have 207 kilograms and one truck could have 209 kilograms.

Genius Challenge

1a. 23

b. 27 R5

c. 120 R1

d. 46

e. 174 R4

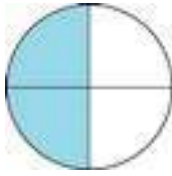
f. 248

2. Each grade receives 207 balloons.

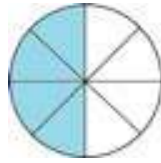
EQUIVALENT FRACTIONS

Extended Practice (Number Problems)

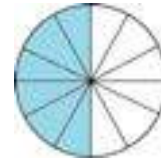
1a.



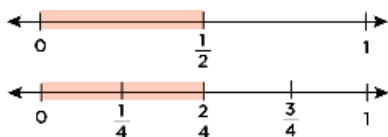
b.



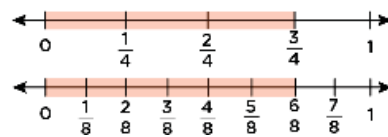
c.



2a.



b.



3a. 2;2

b. 3;3

4a. $\frac{1}{4} \times \frac{5}{5} = \frac{5}{20}$

b. $\frac{4}{6} \times \frac{4}{4} = \frac{16}{24}$

c. $\frac{6}{7} \times \frac{7}{7} = \frac{42}{49}$

5a. $\frac{4}{6}, \frac{6}{9}, \frac{8}{12}$, etc.

b. $\frac{1}{2}, \frac{4}{8}, \frac{6}{12}$, etc.

c. $\frac{2}{14}, \frac{3}{21}, \frac{4}{28}$, etc.

Extended Practice (Word Problems)

1. $\frac{1}{5} = \frac{3}{15}$; Each person gets $\frac{1}{5}$ of the lasagna.

2. $\frac{6}{7} \times \frac{4}{4} = \frac{24}{28}$; They take home the same amount.

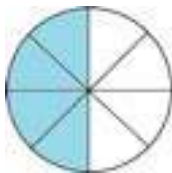
3. $\frac{1}{3} \times \frac{4}{4} = \frac{4}{12}$ and $\frac{1}{3} \times \frac{9}{9} = \frac{9}{27}$

4. Both 20 and 24 are divisible by 4. $20 \div 4 = 5$ and $24 \div 4 = 6$. So $\frac{5}{6}$ is an equivalent fraction.

5. Yes; they are both equivalent to $\frac{2}{3}$

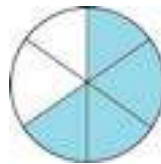
Genius Challenge

1a.



2a. $\frac{2}{8}, \frac{3}{12}, \frac{4}{16}$, etc.

b.



b. $\frac{1}{2}, \frac{6}{12}, \frac{9}{18}$, etc.

c. $\frac{3}{4}, \frac{12}{16}, \frac{18}{24}$, etc.

3a. $14 \div 7 = 2$ and $18 \div 9 = 2$

b. $6 \times 4 = 24$ and $7 \times 4 = 28$

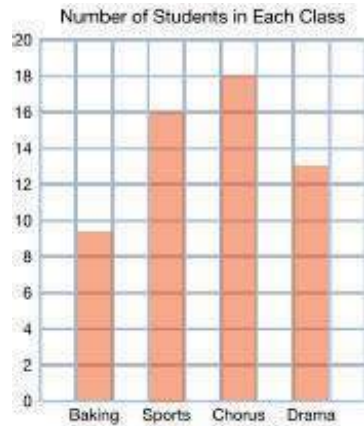
4. Yes; $3 \times 8 = 24$ and $4 \times 8 = 32$, so the fractions are equivalent.

5. No; $\frac{18}{24} = \frac{3}{4}$ so she only needs to cut the block into 4 pieces and use 3 of them.

SOLVE PROBLEMS WITH PICTURE GRAPHS & BAR GRAPHS

Extended Practice (Number Problems)

1a.



b. 2

c. $9 + 16 + 13 + 18 = 56$

3a. 10

b. 4

c. 22

Extended Practice (Word Problems)

1a. 10

b. butterflies

c. 50

2a. \$45

b. \$15

c. \$34

Genius Challenge

1a. 17

b. 6

c. 11

2a. 12

b. 28

c. 8

MULTIPLYING UP TO 4 DIGITS (AREA MODEL)

Extended Practice (Number Problems)

- | | |
|-------------------|------------------|
| 1a. 168 | b. 413 |
| 2a. 1,236 | b. 3,472 |
| 3a. 25,626 | b. 10,835 |
| 4a. 846 | b. 4,725 |

Extended Practice (Word Problems)

- 1.** 270 minutes
- 2.** 152 books
- 3.** \$1,312
- 4.** 980 chairs

Genius Challenge

- | | |
|-----------------------------|-----------------|
| 1a. 344 | b. 2,874 |
| c. 23,720 | d. 918 |
| 3. 2,220 people | |
| 4. 2,432 corn plants | |

SOLVE 2-STEP PROBLEMS WITH ALL 4 OPERATIONS

Extended Practice (Number Problems)

1a. “uses 259 grams” suggests subtraction, “buys another 250 grams” suggests addition. Possible answer: Start with 438 grams, subtract 259 grams, and then add 250 grams.

1b. Step 1: $438 - 259 = 179$; Step 2: $179 + 250 = 429$

1c. Megan has 429 grams of yarn now.

2a. “receives another \$25” suggests addition, “How much more” suggests subtraction. Possible answer: First add \$58 to \$25, and then subtract that sum from \$113 to find out how much more money she needs.

2b. Step 1: $58 + 25 = 83$; Step 2: $113 - 83 = 30$.

2c. Kaylie needs \$30 more to buy the video game.

3a. “each” suggests multiplication, “left over” suggests subtraction. Possible answer: First multiply 3 by 6 to find out how much you spent on muffins. Then subtract that amount from 22 to find out how much is left.

3b. Step 1: $3 \times 6 = 18$; Step 2: $22 - 18 = 4$

3c. You have \$4 left over.

Extended Practice (Word Problems)

1. The group spends \$170 on movie tickets.

2. Mitch can buy 12 baseballs.

3. Janie can buy 9 packs of guitar strings.

4. Together, they can buy 13 slices of cake.

Genius Challenge

1. \$146

2. 8 chairs

3. 108 tomatoes

4. \$23

CLASSIFY QUADRILATERALS BASED ON ATTRIBUTES

Extended Practice (Number Problems)

1. Shapes 1, 2, and 4 (square, parallelogram, square)
2. Shape 2 (square)
- 3a. False b. True c. True d. False
4. Trapezoid
5. Rectangle, Parallelogram, Quadrilateral
6. Answers will vary. The shape has four sides, two sets of parallel sides, and opposite sides have equal lengths.

Extended Practice (Word Problems)

1. C. Ashley, Camden, and Hayden
2. Shape 3
3. Shapes 1 and 3
- 4a. A. Four right angles b. Rectangle

Genius Challenge

1. Row 1: Rectangle, Quadrilateral
Row 2: None of These
Row 3: Rectangle, Rhombus, Quadrilateral
Row 4: Quadrilateral
Row 5: Rhombus, Quadrilateral
2. Answers will vary, but the shape will be a parallelogram.
- 3a. True b. False c. False d. False
4. Shapes 2 and 3

FIND FACTOR PAIRS WITHIN 100

Extended Practice (Number Problems)

1a. 1, 2, 3, 6, 9, 18

b. 1, 17

2a. (1, 31)

b. (1, 48), (2, 24), (3, 16), (4, 12), (6, 8)

3. Two: 1×17 and 17×1

4. Composite; it has 1, 3, 7, and 21 as factors.

5. 8; 2×4

6. $4 \times 4 = 16$

7. 

Extended Practice (Word Problems)

1. 1×24 , 24×1 ; 2×12 , 12×2 ; 3×8 , 8×3 ; 4×6 , 6×4

2. 

3. 1 group of 42, 42 groups of 1, 2 groups of 21, 21 groups of 2, 3 groups of 14, 14 groups of 3, 6 groups of 7, 7 groups of 6

4. $1 \times 5 = 5$

5. She cannot, since 29 is prime. The only factors of 29 are 1 and 29, so she could only arrange the photos in 1 row of 29 or 1 column of 29 photos.

Genius Challenge

1. 1, 2, 3, 5, 6, 10, 15, 30

2. (1, 27), (3, 9)

3. 1, 37; prime

4. (1, 51), (3, 17)

5. 9 has factors 1, 3, 9. This is possible because $3 \times 3 = 9$.

6. 1 row of 24, 2 rows of 12, 3 rows of 8, 4 rows of 6, 6 rows of 4, 8 rows of 3, 12 rows of 2, 24 rows of 1,

7. Sample Answer: To see if Nicoli can divide 31 toys into 5 equal groups, we need to find a factor that we can multiply 5 by to get 31. But there is no whole number that we can multiply by 5 to get 31. So it is impossible for Nicoli to divide 31 toys into 5 equal groups to give to his 5 friends.

8. 1 row of 56, 2 rows of 28, 4 rows of 14, 7 rows of 8, 8 rows of 7, 14 rows of 4, 28 rows of 2, 56 rows of 1

MULTIPLICATION COMPARISONS

Extended Practice (Number Problems)

1a. $8 \times 4 = 32$

b. $9 \times 8 = 72$

2a. $5 \times 4 = 20$; Nate ran 20 laps.

b. $5 \times 6 = 30$; There are 6 lions at the zoo.

3a. $20 \times 2 = 40$; Mrs. French has 40 cups.

b. $\$8 \times 3 = \24 ; A large pizza costs \$24.

4. $4 \times 4 = 16$

Extended Practice (Word Problems)

1. $6 \times 9 = 54$; There are 54 blue fish.

2. $3 \times 10 = 30$; Sue eats 30 cherries.

3. $5 \times 9 = 45$; Joe mowed 45 lawns this week.

4. $4 \times 6 = 24$; Ji caught 24 fish.

5. $8 \times 2 = 16$; Salali made 16 necklaces.

Genius Challenge

1a. 16

b. 15

c. 15

d. 14

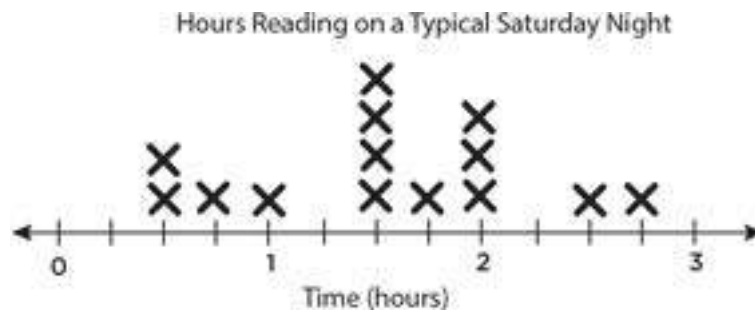
2. $3 \times 14 = 42$, 42 figures

3. $100 \times 4 = 400$, 400 flowers

LINE PLOTS WITH FRACTIONAL MEASUREMENTS

Extended Practice (Number Problems)

1.

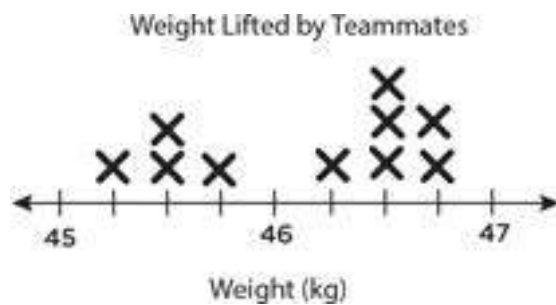


2a. 12 orders

b. $\frac{1}{2}$ pound

c. 1 more order

3a.

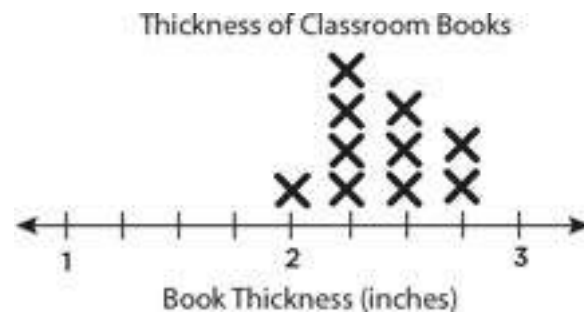


b. 1 more

c. 182 kilograms

Extended Practice (Word Problems)

1a.



b. 2 more

c. $5\frac{1}{2}$ inches

2a. 20 students

b. 10 students

c. 4 students

3a. 17 patients

b. 3 patients

c. 9 patients

Genius Challenge

1a. 7 weeks

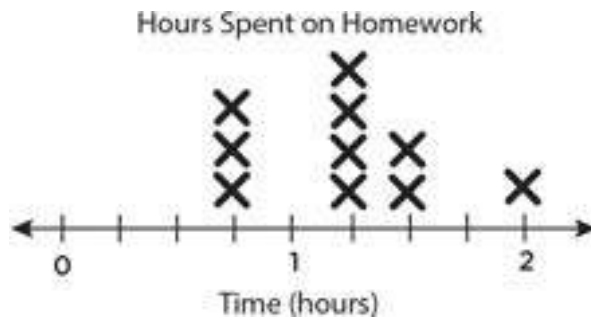
b. $6\frac{3}{4}$ inches

c. $1\frac{1}{4}$ inches

2a. 3 crayons

b. $8\frac{3}{4}$ inches

3a.



b. 3 nights

c. $1\frac{1}{4}$ hours

ADD & SUBTRACT USING THE STANDARD ALGORITHM

Extended Practice (Number Problems)

- 1a. 966
 - 1b. 233
 - 1c. 325
 - 1d. 845
 - 1e. 6,868
 - 1f. 2,742
 - 1g. 7,720
 - 1h. 1,266
2. Victoria didn't line up the numbers by place value.

Extended Practice (Word Problems)

- 1. 4,401 shrimp
- 2. 749 pages
- 3. 3,241 tons
- 4a. 3,723 total bottles
- 4b. 1,079 more water bottles

Genius Challenge

- 1a. 868
 - 1b. 226
 - 1c. 1,224
 - 1d. 1,244
 - 1e. 7,640
 - 1f. 3,224
 - 1g. 4,602
 - 1h. 266
- 2a. 2,201 gems in all
- 2b. 349 more gems

MULTIPLICATION PROPERTIES (COMMUTATIVE, ASSOCIATIVE & DISTRIBUTIVE)

Extended Practice (Number Problems)

1a. 5×8

c. Sample answer: $6 \times 2 \times 14$

2a.



3. C

4. 270; The second grouping was simpler to solve.

b. 28×13

d. Sample answer: $52 \times 5 \times 9$

b. Split the grid into two parts: 7×10 and 7×6 . Find the products and add them together: $7 \times 10 = 70$ and $7 \times 6 = 42$. Together: $70 + 42 = 112$ tiles.

Extended Practice (Word Problems)

1. C; A; D; $400 + 160 = 560$

2a. Correct

b. Incorrect

3a. $= 6 \times 13$

$$= (6 \times 10) + (6 \times 3)$$

$$= 60 + 18$$

$$= 78$$

b. $= 21 \times 20$

$$= (20 \times 20) + (1 \times 20)$$

$$= 400 + 20$$

$$= 420$$

c. $= 4 \times 10 \times 14$

$$= 40 \times 14$$

$$= (40 \times 10) + (40 \times 4)$$

$$= 400 + 160$$

$$= 560$$

4. Answer may vary. $5 \times 13 \times 8 = 5 \times 8 \times 13 = 40 \times 13 = (40 \times 10) + (40 \times 3) = 400 + 120 = 520$. May spent \$520 on books after 8 weeks.

Genius Challenge

1. Answers may vary. The numbers can be arranged in any order.

2. B

3. $7 \times 19 = (7 \times 10) + (7 \times 9) = 70 + 63 = 133$. There are 133 textbooks in total.

4a. $9 \times (4 \times 5) = 9 \times 20 = 180$

b. $(2 \times 5) \times 7 = 10 \times 7 = 70$

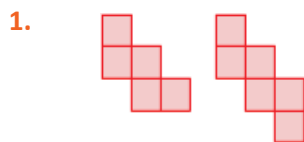
5. Sample steps: $6 \times 16 \times 5 = 6 \times 5 \times 16 = (6 \times 5) \times 16 = 30 \times 16$
 $= (30 \times 10) + (30 \times 6) = 300 + 180$
 $= 480$

GENERATE A PATTERN OF SHAPES OR NUMBERS

Extended Practice (Number Problems)

- 1a. rectangle
 2. left arrow, down arrow
 3a. 35
 c. 76
 4. 1; 2
- b. hexagon
 b. 1,250
 d. 50

Extended Practice (Word Problems)



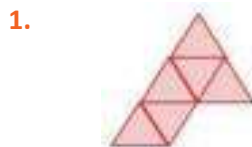
Each pair of shapes makes a picture frame. The rule is flip on a diagonal, then flip across/ horizontally. (The rule could also be rotate 180 degrees, then rotate 90 degrees clockwise.)

3. 80, double; 70, add ten more than before
- 4a. triple and add 1 (or add three times as much as before): 121, 364
 b. double and subtract 1 (or add twice as much as before): 33, 65

5.

Number	0	1	2	3	10	25	99	999
Quadruple plus 5	5	9	13	17	45	105	401	4,001

Genius Challenge



- 3a. 150
 b. 32

4.

Number	2	3	4	7	10	35	99	999
Double minus 2	2	4	6	12	18	68	196	1,996

ADD & SUBTRACT FRACTIONS (LIKE DENOMINATORS)

Extended Practice (Number Problems)

1a. 3 parts shaded; 2 parts shaded; $\frac{5}{6}$

b. 6 parts shaded; 2 parts shaded; $\frac{4}{8}$

2a. $\frac{3}{4}$

c. $\frac{3}{10}$

e. $4 + \frac{3}{5} = 4\frac{3}{5}$

3a. $\frac{17}{7} + \frac{12}{7} = \frac{29}{7} = 4\frac{1}{7}$

b. $\frac{5}{7}$

d. $\frac{1}{8}$

f. $\frac{19}{5} - \frac{12}{5} = \frac{7}{5} = 1\frac{2}{5}$

b. $\frac{16}{3} - \frac{11}{3} = \frac{5}{3} = 1\frac{2}{3}$

Extended Practice (Word Problems)

1. $\frac{3}{4}$

2. $\frac{2}{8}$

3. $6\frac{2}{11}$

4. $1\frac{3}{4} + 2\frac{2}{4} = \frac{7}{4} + \frac{10}{4} = \frac{17}{4} = 4\frac{1}{4}$ cups of sugar

5. $5\frac{1}{6} - 3\frac{4}{6} = \frac{31}{6} - \frac{22}{6} = \frac{9}{6} = 1\frac{3}{6}$ or $1\frac{1}{2}$ kilometers more

Genius Challenge

1a. $\frac{6}{7}$

c. $6\frac{3}{5}$

2a. $4\frac{2}{6}$

3. $\frac{30}{7}$, or $4\frac{2}{7}$ cups

4. $\frac{12}{5}$, or $2\frac{2}{5}$ kilometers

b. $\frac{4}{9}$

d. $2\frac{1}{4}$

b. $\frac{9}{5} = 1\frac{4}{5}$

DIVISION USING AN AREA MODEL (UP TO 4-DIGIT DIVIDEND)

Extended Practice (Number Problems)

1. The width is 8 and the quotient is 16. Answers to the other blanks may vary, but typically will be 5 followed by 1.
2. The width is 12 and the quotient is 21 r 4. Answers to the other blanks may vary, but typically will be 10 followed by 1.
3. The width is 15 and the quotient is 324 r 5. Answers to the other blanks may vary, but typically will be 100 followed by 20, and then 4.
4. 1,075

Extended Practice (Word Problems)

1. 13 weeks
2. 72 golf shots
3. 72 months (because the division is 71 R 15)
4. $4,275 / 12 = 356$, and $356 / 12$ is closest to 30

Genius Challenge

1. 25
2. 417 R 10
3. $1,512 / 3 = 504$, and $504 / 12 = 42$. Amos has averaged 42 kilometers each month.

CONVERT UNITS OF MEASUREMENT

Extended Practice (Number Problems)

- | | |
|-----------|----------|
| 1a. 24 | b. 84 |
| c. 4 | d. 8 |
| 2a. 48 | b. 112 |
| c. 3 | d. 5 |
| 3a. 400 | b. 720 |
| c. 5.02 | d. 0.92 |
| 4a. 4,000 | b. 7,200 |
| c. 5.2 | d. 0.92 |

Extended Practice (Word Problems)

1. Yes; Sample answer: She has 84 inches of ribbon. She needs 80 inches of ribbon. 84 is more than 80, so she has enough.
2. No; She has 96 ounces of dog food. She needs 98 ounces. 96 is less than 98, so she does not have enough.
3. 160 centimeters
4. 0.8 kilograms
5. Sample answer: They are the same height because they are both 5 feet tall.

Genius Challenge

- | | |
|-----------|---------|
| 1a. 108 | b. 7 |
| 2a. 128 | b. 4 |
| 3a. 740 | b. 0.36 |
| 4a. 7,200 | b. 0.4 |
3. Yes; Possible answer: 600 inches of wiring is 50 feet. So, he needs 50 feet of wiring. He has 52 feet of wiring. 52 is more than 50, so he has enough.
 4. 261 grams

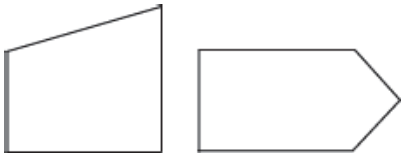
LINES, LINE SEGMENTS & RAYS

Extended Practice (Number Problems)

1. Objects 3 and 5
2. 9
3. Drawings will vary – they should show 6 rays all having a base point of the given point.
4. Pairs 1 and 3
5. 8

Extended Practice (Word Problems)

1. Sample answers: a. the side of a square; b. the light from a flashlight; c. the location of a city on a map
2. The top and bottom each have 3 segments. The sides have 1 segment each. The curves are not line segments. That's 8 segments on the outside in total. The inside has 10 line segments. That's 18 segments in all.
3. Answers will vary. Sample answer:



Genius Challenge

1. Objects 2 and 4
2. 10 line segments; 0 lines; 10 more line segments than lines
3. Answer will vary. Sample answer:



INTRODUCTION TO DECIMALS

Extended Practice (Number Problems)

1a. Shade first two columns

b. Shaded first 9 columns then 7 squares in the final column

2a. =

b. <

c. =

d. <

e. >

f. <

3. He is incorrect. 0.400 shows 4 tenths, 0 hundreds, 0 thousandths. 0.4 also shows 4 tenths, 0 hundreds, 0 thousandths. $0.400 = 0.4$

Extended Practice (Word Problems)

1. $8.2 < 8.8$; Delroy's dog weighs the most.
2. $11.5 < 12$; Fabiana does not have enough punch.
3. $50.23 < 50.32$; Kamal swam the fastest.
4. $5.6 > 5.06$; Anoki lives closest to the school.
5. $5.3 < 5.5$; Hala picked the greater weight of apples.

Genius Challenge

1a. Shade first three columns

b. Shaded first 4 columns then 5 squares in the fifth column

2a. <

b. >

c. >

d. <

3. $4.06 < 4.60$, so Kishi ran the race faster.

4. $10.6 > 10.54$, so David's cat weighs the most.

POWERS OF 10

Extended Practice (Number Problems)

- | | |
|------------|-----------|
| 1a. 10^3 | b. 10^4 |
| c. 10^5 | d. 10^6 |
| 2a. 2,510 | b. 312 |
| c. 470 | d. 6,260 |
| 3a. 34 | b. 1.452 |
| c. 0.0157 | d. 0.075 |
4. The digits shift four places to the left.
5. 5800.6
6. 6.56

Extended Practice (Word Problems)

- 7,234,000 stirrers
- 48 boxes
- 45,400 grams
- 9.5 centimeters long
- 37.32 pounds
- 3,150 tiles

Genius Challenge

- 10^6
- $10 \times 10 \times 10 \times 10$
- 2,500
- 3412.3
- 251 meters
- 62,500 miles

LINES OF SYMMETRY

Extended Practice (Number Problems)

1a. not symmetrical

c. symmetrical



b. symmetrical

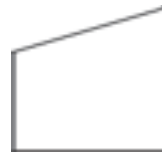
d. not symmetrical

c. Any line passing through the center point

3a. Answers will vary. Sample answer:



b. Answers will vary. Sample answer:



Extended Practice (Word Problems)

1a. F, J, L, P, Q, R, S, Z

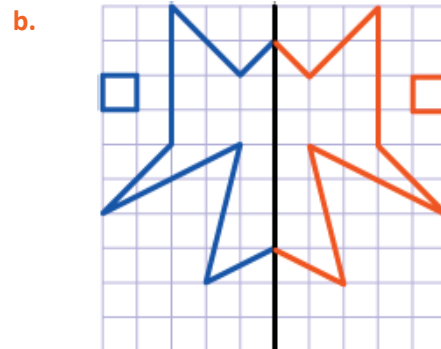
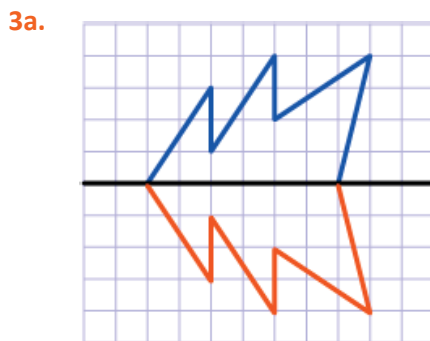
b. Depending how they are drawn, but likely: A, B, C, D, E, M, N, T, U, V, W, Y

c. Depending how they are drawn, but likely: H, I, O, X

2a. 2 lines (vertical through center or horizontal through center)

b. None

c. 3, one from each corner to the center of the opposite side.



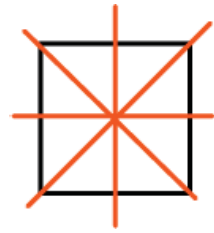
Genius Challenge

1a.



b. None

c.



f. None

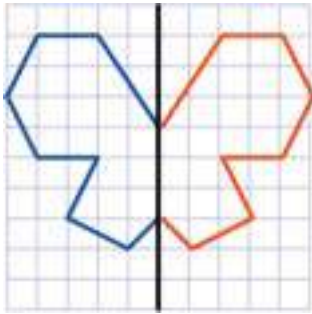
d.



e.



2.



ROUNDING (1,000 & BEYOND)

Extended Practice (Number Problems)

1a.



2a. 5,000

c. 60,000

e. 99,000

g. 530,000

i. 4,780,000

b.



b. 9,000

d. 24,000

f. 400,000

h. 9,000,000

j. 5,000,000

Extended Practice (Word Problems)

1. 9,000 meters

2. 380,000 kilometers

3. 40,000 seats

4. 5,000,000 views

5. 200,000 kg

Genius Challenge

1a. 3,000

c. 58,000

e. 4,000,000

2. 38,000 seats

3. 460,000 cans

b. 100,000

d. 300,000

f. 2,700,000

INTRO TO THE ORDER OF OPERATIONS

Extended Practice (Number Problems)

1a. 7; 42

2a. 9

3a. Add, subtract, multiply

4a. 8

c. 20

b. 48; 6; 8

b. $8\frac{6}{8}$ or $8\frac{3}{4}$

b. Multiply, subtract, divide

b. 60

d. 27

Extended Practice (Word Problems)

1. $2 \times (15 - 7)$

2. $(4 + 8) \div 2$

3. $45 - [10 + (2 \times 10)] = 15$ Dennis has 15 luxury cars in his collection.

4. $[(4 + 6) \times 5] \div 2 = 25$ There will be 25 pens in each box.

Genius Challenge

1a. 4

b. $63\frac{2}{3}$

c. 3

d. 40

e. 7

f. 45

2. $(21 + 21) \div 7$

3. $100 - (40 + 20)$; There are 40 tulips planted in Miguel's garden.

MULTIPLICATION USING THE STANDARD ALGORITHM

Extended Practice (Number Problems)

- 1a.** A rectangle with width 3 and length $100 + 10 + 9$
- b.** 339
- 2a.** A rectangle with width 2 and length $400 + 20 + 3$
- b.** 846
- 3.** 1,668
- 4.** 2,526
- 5.** 3,731
- 6.** 1,998

Extended Practice (Word Problems)

- 1.** 1,895 almonds
- 2.** 416 kilometers
- 3.** 3,915 minutes
- 4.** 18,018 minutes

Genius Challenge

- 1.** 466
- 2.** 11,944
- 3.** 988
- 4.** 299
- 5.** 6,132 chocolate bars
- 6.** \$40,138

SOLVE PROBLEMS WITH DECIMALS (USING ALL 4 OPERATIONS)

Extended Practice (Number Problems)

1a. 0.9

c. 4.8

2a. 1.6

c. 2.4

3a. 4.8 $4 \times 1 = 4$

c. 6.82 $2 \times 3 = 6$

4a. 0.03

5a. 0.2

b. 8.3

d. 3.93

b. 5.12

d. 3.84

b. 15 $6 \times 3 = 18$

d. 7.68 $3 \times 3 = 9$

b. 0.2

b. 0.4

c. 0.42

c. 0.06

Extended Practice (Word Problems)

1. They weigh 2.91 kilograms altogether.
2. Lars lives 3.83 kilometers closer to the school.
3. Amir has 13.8 points in all.
4. They used 0.6 kilogram of flour in each cake.

Genius Challenge

1a. 3.8

c. 2.4

e. 8.2

2a. 9.6

c. 26.4

e. 0.4

b. 2.5

d. 5.87

f. 1.92

b. 11.52

d. 0.08

f. 0.48

3. Selma's best friend lives 1.49 kilometers farther away than her grandparents.
4. 4 packs of tennis balls cost \$27.32.

ADD & SUBTRACT FRACTIONS (UNLIKE DENOMINATORS)

Extended Practice (Number Problems)

1a. $\frac{8}{15}$

c. $\frac{3}{6}$ or $\frac{1}{2}$

e. $\frac{27}{28}$

g. $3\frac{7}{8}$

i. $\frac{2}{5}$

b. $\frac{1}{6}$

d. $\frac{31}{20}$ or $1\frac{11}{20}$

f. $2\frac{11}{12}$

h. $5\frac{3}{8}$

j. $\frac{83}{56}$ or $1\frac{27}{56}$

Extended Practice (Word Problems)

1. $3\frac{5}{8}$ miles

2. $10\frac{1}{4}$ hours

3. $3\frac{11}{12}$ pizzas

4. $2\frac{11}{12}$ hours

5. $\frac{27}{30}$ pound

Genius Challenge

1a. $\frac{4}{6}$ or $\frac{2}{3}$

c. $3\frac{15}{28}$

2a. $\frac{7}{10}$

c. $2\frac{1}{15}$

3a. $8\frac{7}{9}$ miles

b. $\frac{11}{15}$

d. $7\frac{1}{10}$

b. $\frac{9}{40}$

d. $\frac{3}{6}$ or $\frac{1}{2}$

b. $1\frac{4}{9}$ miles

MULTIPLYING FRACTIONS BY FRACTIONS

Extended Practice (Number Problems)

1a. $\frac{3}{4} \times \frac{1}{6} = \frac{3}{24} = \frac{1}{8}$ Or $\frac{1}{6} \times \frac{3}{4} = \frac{3}{24} = \frac{1}{8}$

2a. $\frac{4}{10}$ or $\frac{2}{5}$

c. $\frac{14}{20}$ or $\frac{7}{10}$

e. $\frac{40}{27}$ or $1\frac{13}{27}$

b. $\frac{5}{8} \times \frac{2}{3} = \frac{10}{24} = \frac{5}{12}$ Or $\frac{2}{3} \times \frac{5}{8} = \frac{10}{24} = \frac{5}{12}$

b. $\frac{2}{21}$

d. $\frac{14}{20}$ or $\frac{7}{10}$

f. $\frac{152}{12}$ or $\frac{38}{3}$ or $12\frac{2}{3}$

Extended Practice (Word Problems)

1. $\frac{1}{8}$ of a pizza

2. $\frac{6}{20}$ or $\frac{3}{10}$ of a bucket

3. $\frac{17}{4}$ or $4\frac{1}{4}$ buckets of food

4. $\frac{25}{16}$ or $1\frac{9}{16}$ sticks of butter

5. 4 cups of flour

Genius Challenge

1a. $\frac{3}{5} \times \frac{1}{4} = \frac{3}{20}$ Or $\frac{1}{4} \times \frac{3}{5} = \frac{3}{20}$

2a. $\frac{18}{36}$ or $\frac{1}{2}$

3. $\frac{3}{8}$ of a pizza

4. 1 can of dog food each day

b. $\frac{5}{6} \times \frac{1}{4} = \frac{5}{24}$ Or $\frac{3}{4} \times \frac{5}{6} = \frac{5}{24}$

b. $\frac{26}{12}$ or $\frac{13}{6}$ or $2\frac{1}{6}$

INTERPRETING FRACTIONS AS DIVISION

Extended Practice (Number Problems)

1a. $\frac{2}{3}$

c. $\frac{15}{8}$

e. 4; 5

g. 13; 6

2. $1 \div 4$; Pictures will vary.

3. $3 \div 5 = \frac{3}{5}$. Pictures will vary.

b. $\frac{3}{5}$

d. $\frac{11}{4}$

f. 1; 7

h. 21; 8

Extended Practice (Word Problems)

1. $5 \div 12 = \frac{5}{12}$ foot long

2. $3 \div 4 = \frac{3}{4}$ foot long

3. $9 \div 4 = \frac{9}{4}$ cupcakes, or $9 \div 4 = 2\frac{1}{4}$ cupcakes

4. $5 \div 4 = \frac{5}{4}$ pounds of birdseed, or $5 \div 4 = 1\frac{1}{4}$ pounds of birdseed

5. There is $\frac{3}{8}$ pound of wool in one bag and $\frac{3}{8} + \frac{3}{8} = \frac{6}{8}$ pound in two bags.

Genius Challenge

1a. $\frac{5}{7}$

c. $\frac{25}{8}$

e. 2; 5

g. 17; 6

2. Each person gets $\frac{2}{5}$ of a foot.

3. $2 \div 3 = \frac{2}{3}$ of a candy bar each

b. $\frac{4}{5}$

d. $\frac{43}{4}$

f. 1; 7

h. 27; 8

DIVISION WITH UNIT FRACTIONS & WHOLE NUMBERS

Extended Practice (Number Problems)

1a. 10

b. $\frac{1}{12}$

2a. 12

b. 28

c. $\frac{1}{6}$

d. $\frac{1}{18}$

Extended Practice (Word Problems)

1. 20 garden plots

2. 40 cinnamon rolls

3. 50 bowls

4. $\frac{1}{6}$ of the pie

5. $\frac{1}{4}$ of a bottle

Genius Challenge

1a. 6

b. $\frac{1}{8}$

2a. 42

b. 27

c. $\frac{1}{24}$

d. $\frac{1}{36}$

3. 24 pieces

4. $\frac{1}{20}$ gallon of paint

CALCULATE VOLUME (L X W X H)

Extended Practice (Number Problems)

- 1a. 27 cubic cm
- 1b. 256 cubic m
- 1c. 130 cubic m
- 1d. 343 cubic cm
2. 304 cubic cm
3. 1,077 cubic cm

Extended Practice (Word Problems)

1. 16 cubic meters
2. 30 cubic centimeters
3. 3,000 cubic centimeters
4. The volume of the terrarium is 37,500 cubic cm. 37,500 is greater than 35,000. The terrarium is big enough for the lizard.
5. 51 cubic meters

Genius Challenge

- 1a. 10 cubic m
- 1b. 189 cubic cm
- 1c. 120 cubic cm
- 1d. 125 cubic meters
- 2a. 267 cubic meters
- 2b. 2,728 cubic cm
3. 12 cubic meters
4. 6,750 cubic centimeters

UNDERSTANDING THE BASIC COORDINATE PLATE

Extended Practice (Number Problems)

1a. (0, 3)

c. (7, 6)

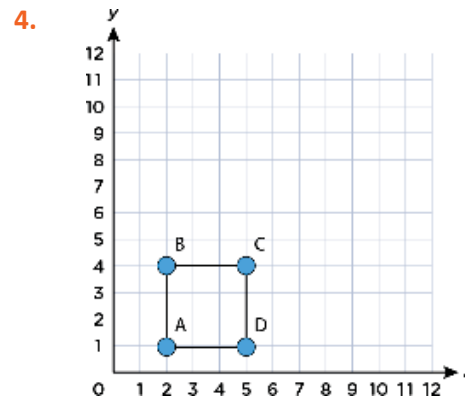
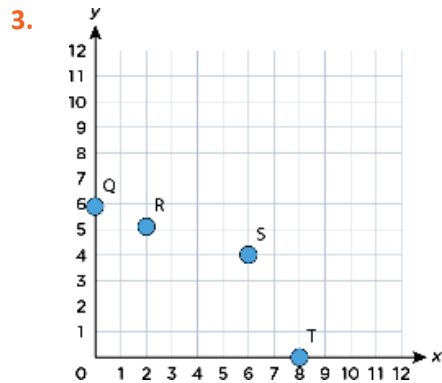
b. (4, 5)

d. (2, 1)

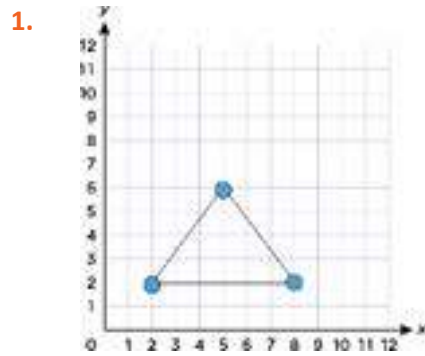
2a. B

b. C

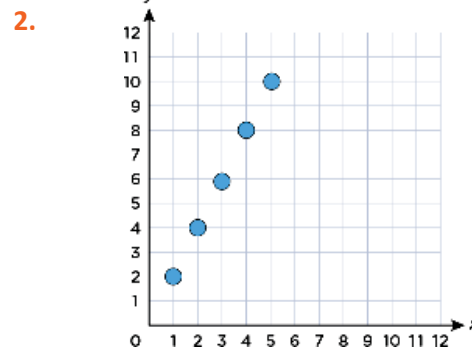
c. K



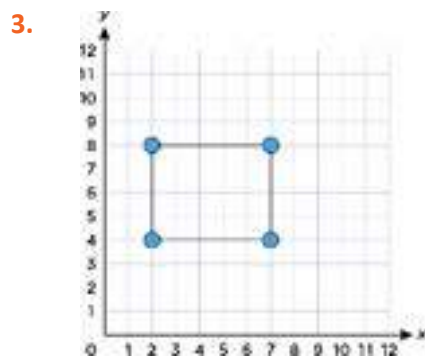
Extended Practice (Word Problems)



Triangle



Cai's shoe size increases as his age increases.



The fourth vertex is (7, 8).

Genius Challenge

1a. (0, 3)

c. (4, 3)

2a. T

c. Y

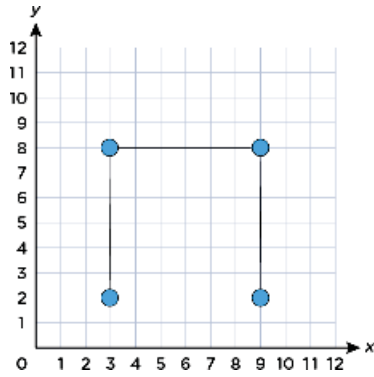
3. The pen will form a square.

b. (3, 2)

d. (1, 4)

b. L

d. Q



CLASSIFY 2D FIGURES IN A HIERARCHY BASED ON PROPERTIES

Extended Practice (Number Problems)

- 1a. Hexagon
- 1b. Nonagon
2. Polygon, quadrilateral, parallelogram, rectangle, kite, rhombus
3. Kite
- 4a. Obtuse isosceles triangle
- 4b. The shape is a trapezoid, and it belongs to the categories of quadrilateral and polygon.
5. square; parallelogram; trapezoid; rhombus

Extended Practice (Word Problems)

1. Both Shawna and Michael are correct. A shape with straight sides is a polygon. More specifically, the shape also has six sides, making it a hexagon. Since the hexagon retains the traits of the polygon, both Shawna and Michael are correct.
- 2a. The student said the triangle had four sides, this is incorrect. The correct definition is “A three-side polygon with two equal sides and all acute angles.”
- 2b. The student said the rectangle has all obtuse angles, this is incorrect. The correct definition is “A four-sided polygon with two sets of parallel sides and all right angles.”
- 3a. Sinead is correct that both rhombus and square are subgroups of kite. This is true because the rhombus and square also have pairs of adjacent sides that are the same length, just like a kite does.
- 3b. Sinead is incorrect about the trapezoid being a subgroup of square. A trapezoid has only one set of parallel lines, and a square has two sets of parallel lines. The square doesn’t have any subgroups.
4. Mary’s observation is true for all concave polygons, as they have all straight sides, at least one reflex interior angle, and can all be partitioned into convex polygons.
5. No, triangles have three sides and quadrilaterals have four. It is true that they both have straight sides and so are both polygons, but they differ in the property “number of sides.”

Genius Challenge

1. A, B, F

2a. yes

c. yes

e. yes

b. no

d. yes

f. no

3. Alexandria is correct because rectangle is a subgroup of parallelogram, meaning that the rectangle inherits all the parallelogram properties and has the properties of a rectangle. It has two sets of parallel sides (definition of a parallelogram) and all right angles (definition of a rectangle).

4. A hierarchy is a system of categorization that sorts things into more and more specific categories based on their properties. The things in a subgroup retain all the properties of the supergroup.

ROUNDING (WITHIN 100)

Extended Practice (Number Problems)

1. A number line from 120 to 130 with tick marks every 1, labels at 120, 123, 125, and 130. 123 rounds to 120.

2a. 80

b. 20

c. 60

d. 720

e. 580

f. 410

3. A number line from 700 to 800 with tick marks every 10, labels at 700, 750, 758, and 800. 758 rounds to 800.

4a. 100

b. 700

c. 900

d. 700

e. 100

f. 200

5. No; Jeremy looked at the hundreds place, but he should have looked at the tens place. The digit in the tens place is 1, so he should round down to 700.

Extended Practice (Word Problems)

1. 30 students

2. 40 minutes

3. 360 kilometers

4. 600 students

5. 800 people

6. 390 spectators

Genius Challenge

1a. 70

b. 90

c. 470

d. 890

2a. 500

b. 400

c. 300

d. 900

3. 40 toy robots

4. 100 model cars

INTRO TO REMAINDERS IN A DIVISION PROBLEM

Extended Practice (Number Problems)

1a. $2 \text{ R } 1$

c. $2 \text{ R } 1$

e. $5 \text{ R } 3$

g. $1 \text{ R } 18$

i. $8 \text{ R } 2$

2a. Yes

c. No

3a. $1\frac{1}{4}$

c. $3\frac{1}{3}$

4a. 2

c. 3

e. 3

b. $1 \text{ R } 1$

d. $4 \text{ R } 2$

f. $7 \text{ R } 3$

h. $10 \text{ R } 2$

j. $7 \text{ R } 8$

b. No

d. Yes

b. $2\frac{1}{2}$

d. $2\frac{1}{2}$

b. 3

d. 3

f. 4

Extended Practice (Word Problems)

1. $7 \text{ R } 2$; 8 tables

2. $5\frac{1}{3}$ brownies

3. $3 \text{ R } 5$; 3 lasagnas

4. $7 \text{ R } 4$; 7 shelves

5. $4\frac{1}{4}$ cups

6. $4 \text{ R } 4$; 5 rows

Genius Challenge

1a. 2 R2

c. 1 R 1

e. 5 R 4

g. 8 R 4

i. 8

k. 16 R 2

2. 5 R 7; 5 stickers

3. 9 R 2; 10 boxes

4. $3\frac{1}{5}$ cups

b. 6 R 2

d. 10 R 2

f. 13

h. 5 R 1

j. 10 R 4

l. 15 R 1

ADD & SUBTRACT WITH NEGATIVE NUMBERS

Extended Practice (Number Problems)

1. -2
2. 8
3. 3
4. -10
5. 17
6. 1
7. -9
8. -5
9. -15
10. 11

Extended Practice (Word Problems)

1. $-5 + 12 = 7$. The temperature at noon today is 7 degrees.
2. $-12 - 7 = -19$. The temperature at noon today is -19 degrees.
3. $-5 - 3 = -8$. The scuba diver is at a depth of -8 meters.
4. $20 - 30 = -10$. She is at 10 meters below sea level.
5. $17 - (-3) = 20$. The difference in elevation is 20 meters.

Genius Challenge

1. -7
2. 14
3. 5
4. 3
5. -18
6. 8
7. $-9 + 13 = 4$. The temperature at noon today is 4 degrees.
8. $-8 - 5 = -13$. The scuba diver is at a depth of -13 meters.
9. $21 - (-6) = 27$. The difference in elevation is 27 meters.

IRRATIONAL NUMBERS

Extended Practice (Number Problems)

- 1a. $\sqrt{25} = 5$. This is a whole number, so it is rational.
- b. $\frac{\sqrt{21}}{\sqrt{7}} = \frac{4.582575\dots}{2.645751\dots}$ Both the numerator and denominator are irrational numbers. This number is irrational.
- c. $\pi = 3.14159265 \dots$ Since the number is non-terminating and non-repeating, the number is irrational.
- d. $\sqrt[18]{8} = 0.\overline{6}$ The number evaluates to a non-terminating, repeating decimal, so the number is rational.
- e. This is a ratio of two integers. It is rational.
- f. While the decimal expansion of this number continues for many digits before repeating, it does repeat. This is a ratio of two integers. It is rational.
2. $43.9823 = u(14)$
 $u = 3.14159286$

Extended Practice (Word Problems)

1. $a = 10$ (height up the wall), $b = 3$ (distance from the wall), $c = ?$ (length of the ladder)

$$c^2 = a^2 + b^2$$

$$c^2 = 10^2 + 3^2$$

$$c^2 = 100 + 9$$

$$c^2 = 109$$

$$\sqrt{c^2} = \sqrt{109}$$

$$c = \sqrt{109}$$

The length of the ladder is $\sqrt{109}$ feet, or approximately 10.44 feet. This value is irrational because it is a square root of a non-perfect square.

2. The number $\frac{23}{9}$ is rational because it is a ratio of integer values. The number $2.55555555\dots$ is rational because the decimal repeats.
3. Michael is correct. Square roots are only irrational if they are square roots of non-perfect squares. The square root of 4 is 2, and because 4 is a perfect square, $\sqrt{4}$ is rational.
4. The irrational numbers are $0.928463759487362\dots$, and $\sqrt{18}$.

Genius Challenge

1. 23.5 (Rational), 0 (Rational), 1 (Rational), $-22.3434\dots$ (Rational), $\sqrt{15}$ (Irrational), $\sqrt{16}$ (Rational), $\frac{32.5}{22.9}$ (Rational), $0.67457382059543\dots$ (Irrational)
2. The product of a rational and irrational number is always irrational. Since the circumference of the circle is the product of the irrational number π and the positive integer diameter, the circumference must also be irrational.
3. $a = 20$ (distance to friend), $b = ?$ (height off the ground), $c = 50$ (length of string)

$$c^2 = a^2 + b^2$$

$$50^2 = 20^2 + b^2$$

$$50^2 - 20^2 = b^2$$

$$2,500 - 400 = b^2$$

$$2,100 = b^2$$

$$\sqrt{2,100} = \sqrt{b^2}$$

$$\sqrt{2,100} = b$$

$$45.8257569 \dots = b$$

$$45.8 \approx b$$

The kite is approximately 45.8 feet off the ground. The height is an irrational number because the square root is of a non-perfect square, which produces a decimal that is non-terminating and non-repeating.

SOLVE PROBLEMS WITH RATIOS AND PROPORTIONS

Extended Practice (Number Problems)

1a. $x = 36$

c. $x = 9$

b. $x = 65$

d. $x = 40$

2a. 24 bananas

b. 4 pears

c. 1 pear

3a. 8 cups

b. \$18

c. 3 cups

4a. $x = 25$

c. $x = 2$

b. $x = 24$

d. $x = 5$

Extended Practice (Word Problems)

1a. 15 tablespoons

b. 8 teaspoons

c. 10 cups

d. 24 grams

2. The ratio 4:9 compares adults to children, but I need to compare adults to total people. Add the ratio parts: $4 + 9 = 13$. Now the ratio of adults to total people is 4:13, and the equation is $4:13 = 12:x$. Solve for x and find $x = 39$. There are 39 people at the party.

3. $300:500 = 60:x$; $x = 100$ milliliters

4a. 3:1

b. $3:1 = 12:4$, so there are 4 male guinea pigs.

Genius Challenge

1a. $x = 8$

c. $x = 11$

b. $x = 63$

d. $x = 3$

2. $6:7 = x:63$; $x = 54$. There are 54 volleyballs.

3. $90:75 = x:15$; $x = 18$. Today's gas costs \$18.

4. The staff to total people ratio is 2:21, so $2:21 = 44:x$. Solve for x to find $x = 22 \times 21 = 462$.

There are 462 people in the school.

5. The whole wheat flour to white flour ratio is 480:120, so $480:120 = 120:x$. Solve for x : $x = 30$. I need 30 grams of white flour.

DETERMINE NUMBER OF SOLUTIONS FOR LINEAR EQUATIONS

Extended Practice (Number Problems)

1a.

$$\begin{aligned}(2)(x) + (2)(-7) &= 4x + 12 \\ 2x - 14 &= 4x + 12 \\ 2x - 14 + 14 &= 4x + 12 + 14 \\ 2x &= 4x + 26 \\ 2x - 4x &= 4x + 26 - 4x \\ -2x &= 26 \\ \frac{-2x}{-2} &= \frac{26}{-2} \\ x &= -13\end{aligned}$$

b.

$$\begin{aligned}3x - 4 &= (5)(x) + (5)(-5) \\ 3x - 4 &= 5x - 25 \\ 3x - 4 + 4 &= 5x - 25 + 4 \\ 3x &= 5x - 21 \\ 3x - 5x &= 5x - 21 - 5x \\ -2x &= -21 \\ \frac{-2x}{-2} &= \frac{-21}{-2} \\ x &= \frac{21}{2}\end{aligned}$$

c.

$$\begin{aligned}(5)(x) + (5)(-3) &= (4)(x) + (4)(-7) \\ 5x - 15 &= 4x - 28 \\ 5x - 15 + 15 &= 4x - 28 + 15 \\ 5x &= 4x - 13 \\ 5x - 4x &= 4x - 13 - 4x \\ x &= -13\end{aligned}$$

2a. infinite solutions

b. one-solution

c. no solutions

d. no solutions

3. Sasha is not correct. The last line is a false equation. That means that the equation has no solutions.

Extended Practice (Word Problems)

1a.

$$\begin{aligned}3x - 4 &= 2(x - 3) \\ 3x - 4 &= (2)(x) + (2)(-3) \\ 3x - 4 &= 2x - 6 \\ 3x - 4 + (4) &= 2x - 6 + (4) \\ 3x &= 2x - 2 \\ 3x + (-2x) &= 2x - 2 + (-2x) \\ (x) &= (-2)\end{aligned}$$

b.

$$\begin{aligned}4x - 4 &= 6(x - 7) \\ 4x - 4 &= (6)(x) + (6)(-7) \\ 4x - 4 &= 6x - 42 \\ 4x - 4 + (4) &= 6x - 42 + (4) \\ 4x &= 6x - 38 \\ 4x + (-6x) &= 6x - 38 + (-6x) \\ (-2x) &= (-38) \\ (x) &= (19)\end{aligned}$$

2. Jenna is correct. If I expand the left side using the distributive property, I get $2x - 6 = 2x - 6$. Then if I subtract $2x$ from both sides, I get $-6 = -6$. Since this simplified equation is true, there are infinitely many solutions.

3a. one solution

b. one solution

c. no solution

d. infinitely many solutions

Genius Challenge

- 1a. one solution; $x = -4$
- c. infinitely many solutions
- e. one solution; $x = -\frac{9}{8}$

- b. no solutions
- d. no solutions
- f. one solution; $x = \frac{4}{5}$

2a. The error is in the second line. When using the distributive property on the left side, the 3 is multiplied by the x but not the -6 .

b. $3(x - 6) = 12$

$$3x - 18 = 12$$

$$3x = 30$$

$$x = 10$$

SOLVE SYSTEMS OF EQUATIONS

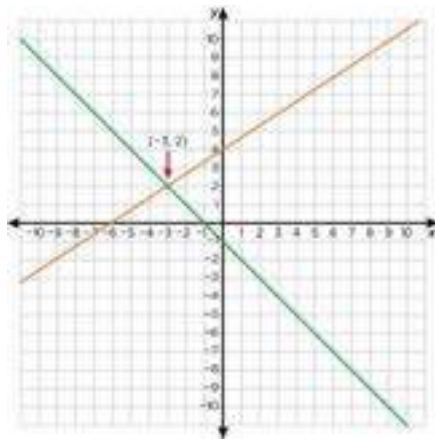
Extended Practice (Number Problems)

1a. $(-4, 7)$

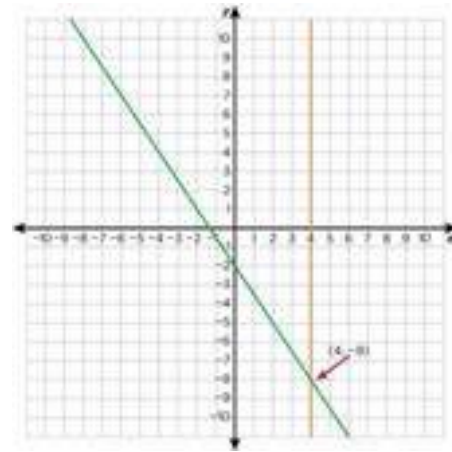
b. $(-1, 1)$

c. $(8, 6)$

2a.



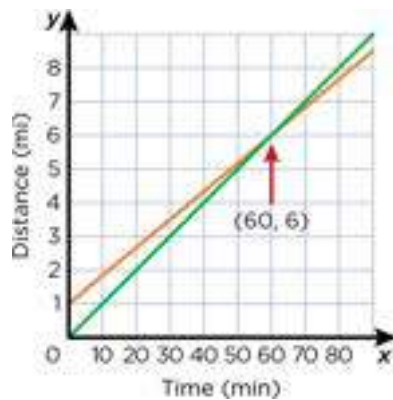
b.



Extended Practice (Word Problems)

1. A comic costs \$3 and a novel costs \$7.

2. Jack will catch up with Devin about 6 miles from the start line, after 60 minutes.

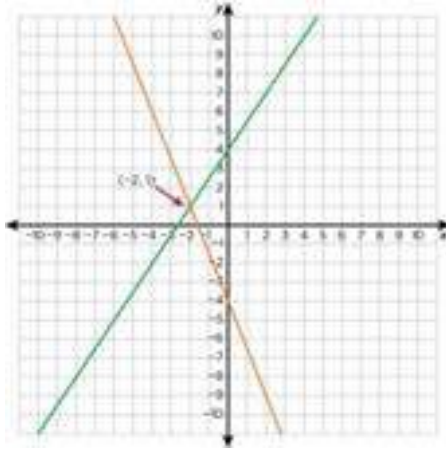


Genius Challenge

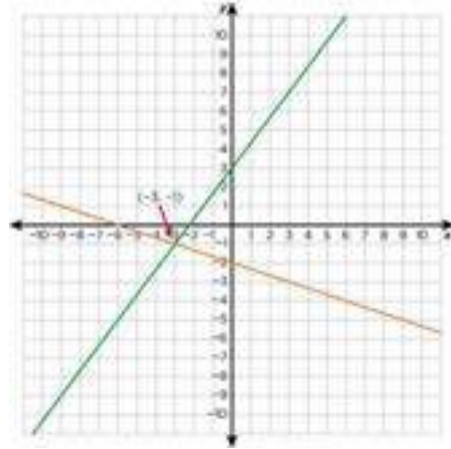
1a. $(2, 0)$

b. $(-4, -6)$

2a.



b.



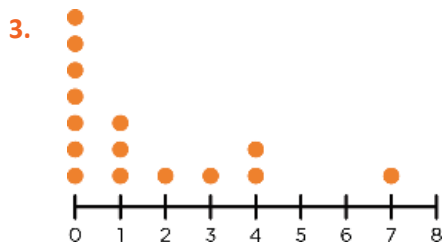
3. Muffins sold for \$8 and cake sold for \$13.

STATISTICS: RANDOM SAMPLES & COMPARING DATA SETS

Extended Practice (Number Problems)

1. The histogram for female lizards has about the same spread as the histogram for male lizards, but the center of the distributions is different. For the male lizards, the center is around 15 cm, and for the female lizards it is around 13 cm. This means that Melissa can conclude that male lizards are larger than female lizards, on average.

2. Antony did not take a sample that was representative of the population. His population of interest was all students in the school, but his sample was only students in music class. It is likely that people in a music class play more instruments than other people in the school. This difference means Antony's sample is biased and doesn't represent all students in the school. Antony should have taken a random sample of the students in the school to ensure that his sample was representative.



The data show that most students have no absences, some students have 1-4 absences, and 1 student has 7. In general, attendance for 8th grade students in this school is good.

Extended Practice (Word Problems)

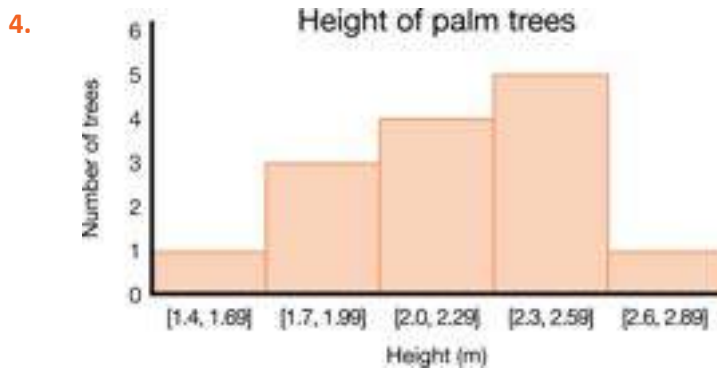
1. Janet should choose manufacturer A. Both manufacturers produce parts with a mean length around 14 cm, but manufacturer A has a much smaller spread than manufacturer B. This means that the parts from Manufacturer A are more consistent, so they are a better choice for Janet.

2. Meredith's data is biased by its small sample size. It is possible that the 5 people she spoke to were all vegetarian, and so the sample doesn't reflect the whole school. Meredith also didn't specify how she chose the people she spoke to. To improve the study, she needs to take a larger sample and select the individuals randomly.

3. A statistical question is one where the answers are uncertain and vary between individuals. If the question only has one possible answer, then it is not a statistical question. Some examples of statistical questions include "how tall are palm trees?" "how fast do marathon runners run?" and "what are people's favorite music genres?"

Genius Challenge

1. Sampling allows us to answer statistical questions about a population by making inferences based on data from a subset of the population. Sampling can save time, money, and effort while still giving good information.
2. Sample bias is the degree to which a sample is different from the population. Convenience sampling and small sample size both increase bias in a sample. It is best to use a random sample with a large enough size to make sure you can make valid inferences about the population with minimal bias.
3. When looking at the histograms, I would look for their centers and spreads. If their centers are far away and their spread is small, then there is very little overlap between the distributions. This low overlap would mean that the distributions are likely from very different populations. If there is a lot of overlap, then the centers would be closer together and the spreads larger, indicating that the distributions are likely from very similar populations.



GREATEST COMMON FACTOR & LEAST COMMON MULTIPLE

Extended Practice (Number Problems)

- | | |
|---------------|--------------|
| 1a. 60 | b. 6 |
| c. 56 | d. 60 |
| e. 18 | f. 28 |
| 2a. 10 | b. 9 |
| c. 12 | d. 2 |
| e. 1 | f. 6 |

3. Marina is incorrect. She listed multiples of the numbers instead of factors. She also found the least number in each list instead of the greatest number in each list. She found the LCM of 8 and 24.

Extended Practice (Word Problems)

- 6 signs
- They can have 6 tables with 3 bottles of soda and 5 bottles of lemonade on each table.
- 15 days
- 15 plants
- She can give 4 flyers and 3 stickers to each of 6 classrooms.

Genius Challenge

- | | |
|---------------|--------------|
| 1a. 42 | b. 21 |
| c. 18 | d. 24 |
| 2a. 2 | b. 1 |
| c. 15 | d. 2 |
- Barrack can make 6 arrangements of 7 carnations and 6 lilies.
 - 4 packages of 12 cups is 48 cups in all. 6 packages of 8 plates is 48 plates in all.

INTEGER EXPONENTS

Extended Practice (Number Problems)

1a. $\frac{1}{32}$

d. 1

b. $\frac{1}{9}$

e. $\frac{1}{8}$

c. $\frac{1}{10,000}$

f. $\frac{1}{256}$

2a. $5^{-2-7} = 5^{-9} = \frac{1}{1,953,125}$

c. $2^{-6+2} = 2^{-4} = \frac{1}{16}$

e. $4^{-4-5} = 4^{-9} = \frac{1}{262,144}$

3a. $3^{6-(-2)} = 3^8 = 6,561$

c. $5^{-6-(-5)} = 5^{-1} = \frac{1}{5}$

4a. 0.032

c. -500

b. $3^{4-4} = 3^0 = 1$

d. $7^{2-3} = 7^{-1} = \frac{1}{7}$

f. $3^{5-2} = 3^3 = 27$

b. $10^{-3-3} = 10^{-6} = \frac{1}{1,000,000}$

d. $3^{-3-(-5)} = 3^2 = 9$

b. approximately 0.074

d. 48

Extended Practice (Word Problems)

1. 0.000001 m

2. 0.0004 kg

3. $\frac{2^{-5}}{2^{-8}} = 2^{-5-(-8)} = 2^3 = 8$. Insect A weighs 8 times more than Insect B.

4. $(3 \times 10^{13}) \times (9 \times 10^{-13}) = 3 \times 9 \times 10^{13} \times 10^{-13} = 3 \times 9 \times 1 = 27$. The bacteria in the human body weighs approximately 27 g.

5. No, Shiek did not divide correctly. He needed to subtract -2 from 7 to find an equivalent expression. So, the power should be $7 - (-2) = 9$. The value of the expression is 512.

Genius Challenge

1a. $\frac{1}{64}$
c. $\frac{1}{100,000}$

2a. $4^{-2-6} = 4^{-8} = \frac{1}{65,536}$
c. $3^{6-7} = 3^{-1} = \frac{1}{3}$

3a. $\frac{3}{8} = 0.375$
c. $-200,000$

4. 0.001 m

5. 0.000003 kg

b. $\frac{1}{25}$
d. $\frac{1}{16}$

b. $2^{4-4} = 2^0 = 1$

d. $4^{-3-(-6)} = 4^3 = 64$

b. 0.0006

d. 80

ANGLE RELATIONSHIPS IN TRIANGLES AND TRANSVERSALS

Extended Practice (Number Problems)

- 1a. 57°
- 2a. 35°
- c. 62°
- 3a. supplementary
- b. congruent
- c. supplementary
- d. congruent
- e. congruent
- b. 85°
- b. 55°
- d. 33°

Extended Practice (Word Problems)

- 1. 115° .
- 2. 65° ; yes, the angle is sharper than 70° , so it is too sharp.
- 3. 38°
- 4. Answers will vary. Supplementary Angles – Angles that add to 180° . Corresponding angles - Angles that are in the same position on both intersections. Interior Angles - Angles that are both on the inside of the parallel lines. Exterior Angles - Angles that are both on the outside of the parallel lines. Alternate Angles - Angles that are across from each other on different lines.

Genius Challenge

- 1a. 62°
- c. 71°
- b. 43°
- d. 103°
- 2. Congruent angles are 99° , supplementary angles are 81° .
- 3. $x + x + 40 = 180$; $2x + 40 = 180$; $2x = 140$; $x = 70$
The first angle is 70° . The second angle is $70 + 40 = 110^\circ$.

SCALE DRAWINGS (USING SCALE FACTOR)

Extended Practice (Number Problems)

- 1a. 3
- b. 24
- c. $\frac{1}{3}$

- 2a. 5
- b. 30
- c. 4

3. B, D, and E

4. The side lengths are 5 units and 7 units. $5 \times 2 = 10$ and $7 \times 2 = 14$, so the area is 140 square units.

Extended Practice (Word Problems)

1. 90 square centimeters

2a. 2.5 m, $3\frac{1}{3}$ m, $4\frac{1}{6}$ m

b. $\frac{1}{2} \times \frac{5}{2} \times \frac{10}{3} = \frac{50}{12} = 4\frac{1}{6}$ square meters

c. 12

3. First apply the scale factor: $3 \times 110 = 330$ inches
Then convert inches to feet: $330 \div 12 = 27.5$ feet

Genius Challenge

1. No, because $\frac{18}{12} = 1.5$, but $15 \times 1.5 = 22.5$ rather than 21.

2a. 2.5 cm

b. 4

c. 28 cm

3a. 14 feet

b. 1:3 or $\frac{1}{3}$

c. $(16, 4\frac{2}{3})$ and $(0, 4\frac{2}{3})$

d. $74\frac{2}{3}$ square feet

HOW MANY TRIANGLES CAN YOU MAKE? (GIVEN CONDITIONS)

Extended Practice (Number Problems)

- 1a. No triangles
 - b. One unique triangle
 - c. Infinitely many triangles
 - d. No triangles
2. It can be done. Answers will vary.
3. It cannot be done because the two shortest sides together are equal to the longest side. They need to be greater than the longest side.

4.

Conditions	One Triangle	No Triangles	Infinitely Many Triangles
Sides 3 cm, 4 cm, 5 cm	x		
Sides 11 cm, 11 cm, 24 cm		x	
Sides 8 cm, 8 cm, 8 cm	x		
Angles 25°, 80°, 75°			x
Angles 15°, 55°, 100°		x	
Angles 45°, 45°, 90°			x

Extended Practice (Word Problems)

1. No. Emma's triangle's three angles have to add up to 180 degrees. Her two angles so far are greater than 180 degrees.
2. He must use the 7-foot pole. The length of the third pole has to be less than the sum of the two 4-foot poles combined, so the other poles are all too long.
3. Answers a and c
4. Katrina is not correct. The two shorter sides together must be greater than the longest side NOT greater than or equal to.
5. Option b

Genius Challenge

1. No triangles. The two shortest sides together need to be greater than the longest side.

2.

Conditions	One Triangle	No Triangles	Infinitely Many Triangles
Sides 2 cm, 3 cm, 4 cm	x		
Sides 2 cm, 3 cm, 5 cm		x	
Sides 6 cm, 6 cm, 6 cm	x		
Angles 35°, 70°, 75°			x
Angles 15°, 75°, 100°		x	
Angles 40°, 45°, 90°		x	

3. Answers will vary. The longest side must be less than 54 cm (14 cm + 40 cm). Any side length 54 cm or greater could not form the triangle.

SOLVE ALGEBRAIC EQUATIONS (1-STEP)

Extended Practice (Number Problems)

- | | |
|---------------|-------------------------|
| 1a. 5 | b. 29.4 |
| c. 4 | d. -6 |
| e. 5 | f. -4 |
| g. 12 | h. $\frac{4}{5}$ |
| i. 47 | j. $\frac{2}{7}$ |
| k. 9.4 | l. $\frac{5}{8}$ |
|
 | |
| 2a. 6 | b. 1 |
| c. 7 | d. 24 |
| e. 6 | f. 99 |
| g. 12 | h. 12 |
| i. 35 | j. 50 |

Extended Practice (Word Problems)

1. You got \$25 for your birthday.
2. You harvested 53 tomatoes.
3. You beat 6 levels.
4. Molly's summer vacation was 57 days long.
5. Her paycheck was \$148.

Genius Challenge

1a. 13

c. 65

e. -2

2a. 6

c. 27

e. 13

3. She had 60 candies to start with.

4. She made 33 squares.

b. 16.2

d. $\frac{3}{5}$

f. $\frac{5}{6}$

b. 3

d. 72

f. 300

PROPORTIONAL RELATIONSHIPS (IN DATA TABLES, EQUATIONS & GRAPHS)

Extended Practice (Number Problems)

1a. 3

b. 4

c. 9

d. $\frac{1}{2}$

e. 2.4

2a. Proportional

b. Non-proportional

c. Proportional

d. Proportional

3a. Non-proportional

b. Proportional

c. Non-proportional

d. Proportional

e. Proportional

f. Proportional

g. Non-proportional

h. Non-proportional

Extended Practice (Word Problems)

1. Table may vary. The relationship is proportional. The number of puzzles is always 4 times the number of days.

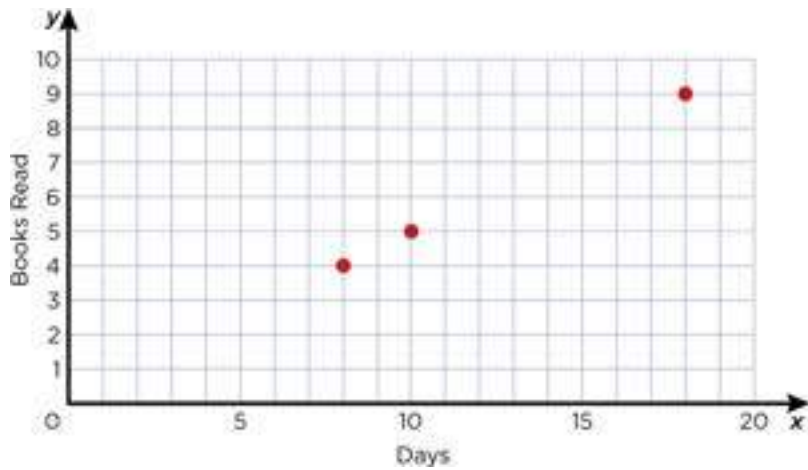
x	y
1	4
2	8
3	12

2. The relationship is not proportional. The number of songs learned is sometimes 5 times the number of lessons, and sometimes 4 times the number of lessons.

x	y
1	5
2	10
3	12
4	16

3. $y = 10x + 5$; The relation is not proportional.

4. The relationship is proportional.



Genius Challenge

1a. 4

b. $\frac{1}{3}$

c. 2.5

2a. Non-proportional

b. Non-proportional

c. Proportional

d. Proportional

e. Proportional

f. Non-proportional

g. Proportional

h. Non-proportional

3. $y = 5x$, where x is the number of pictures and y is the number of nails. The relation is proportional.

INTRO TO FUNCTIONS

Extended Practice (Number Problems)

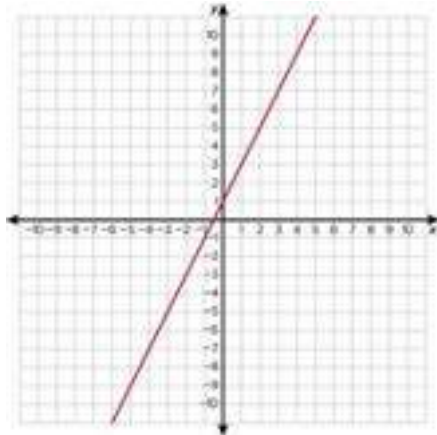
1a. Not a function

c. Function

2a. $f(4) = 28$

c. $f(7) = 58$

3.



b. Function

d. Not a function

b. $x = 3$

d. $x = 8$

Extended Practice (Word Problems)

1. To be a function, the graph needs to pass the vertical line test. Since there is at least one place where a vertical line crosses the graph twice, the graph is a relation but not a function. Arthur is correct.

2. Freyja is not correct. The function notation $f(6)$ means f of 6, and it does not mean f multiplied by 6. Freyja's last step is incorrect, and the correct answer is $f(6) = 22$.

3a. $f(x) = 0.2x + 3$

b. $f(x) = 0.2x + 3$

$$f(15) = 0.2(15) + 3$$

$$f(15) = 3 + 3$$

$$f(15) = 6$$

The cab fare for a 15-mile trip is \$6.

c. $10 = f(x)$

$$10 = 0.2x + 3$$

$$10 - 3 = 0.2x + 3 - 3$$

$$\frac{7}{0.2} = \frac{0.2x}{0.2}$$

$$35 = x$$

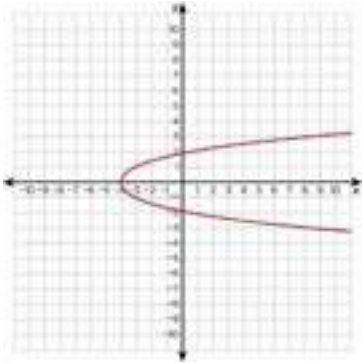
She can afford to travel 35 miles if she only has \$10.

Genius Challenge

1. $\{(-5,25), (-4,16), (-3,9), (-2,4), (-1,1), (0,0), (1,1), (2,4), (3,9), (4,16), (5,25)\}$

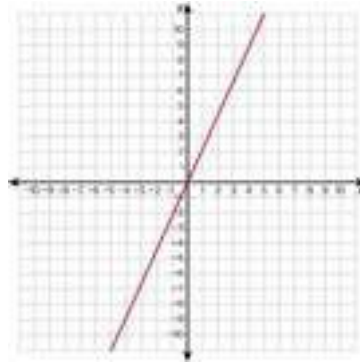
The relation is a function because the graph passes the vertical line test. None of the x-values repeat in either the table of values or the set of ordered pairs.

2a.



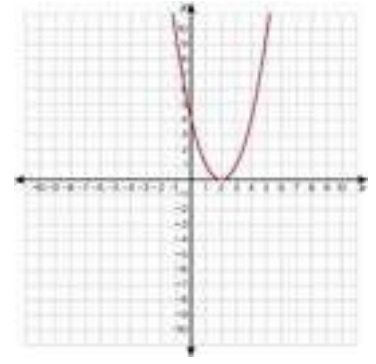
3a. $f(3) = 13$

b.



b. $f(3) = -5$

c.



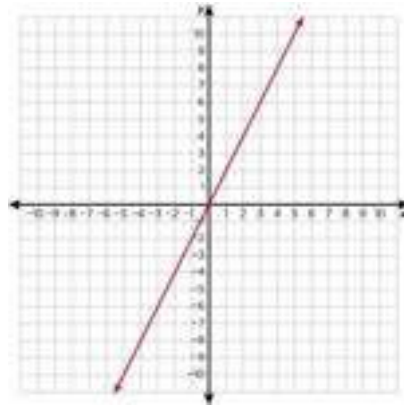
c. $f(3) = 7$

GRAPHING LINEAR EQUATIONS: SLOPE & Y-INTERCEPT ($Y = MX + B$)

Extended Practice (Number Problems)

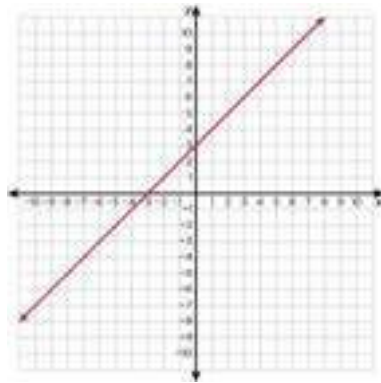
1a.

x	y
-2	-4
-1	-2
0	0
1	2
2	4



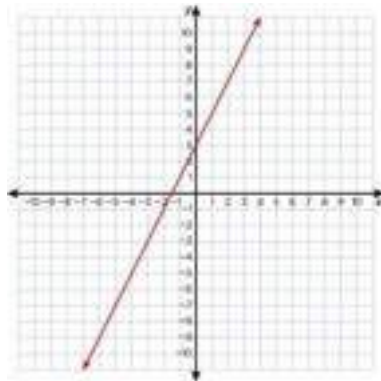
b.

x	y
-2	1
-1	2
0	3
1	4
2	5



c.

x	y
-2	-1
-1	1
0	3
1	5
2	7



2a. -3

b. 2

c. $y = -3x + 2$

Extended Practice (Word Problems)

1a. The constant is -300 dollars, because it costs Amanda $\$300$ to rent and set up the gym.

b. The rate is 10 dollars per ticket.

c. Let x represent the number of tickets sold (independent variable). Let y represent Amanda's profit (dependent variable). Then, $y = 10x - 300$.

d. $y = 10x - 300$

$$y = 10(50) - 300$$

$$y = 500 - 300$$

$$y = 200$$

Amanda's profit is $\$200$ if she sells 50 tickets.

e. $y = 10x - 300$

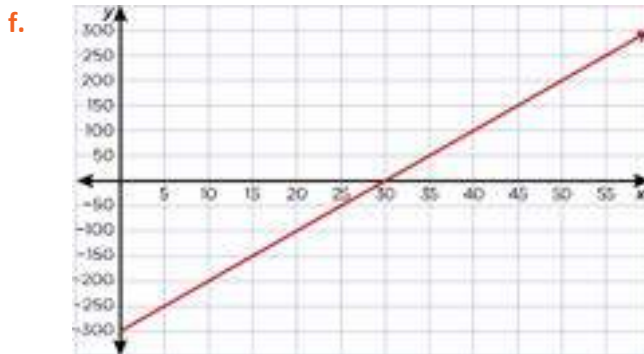
$$0 = 10x - 300$$

$$0 + 300 = 10x - 300 + 300$$

$$\frac{300}{10} = \frac{10x}{10}$$

$$30 = x$$

Amanda has to sell 30 tickets to break even.



2. Point 1 (10, 6) gives $x_1 = 10, y_1 = 6$

Point 2 (-2, 4) gives $x_2 = -2, y_2 = 4$

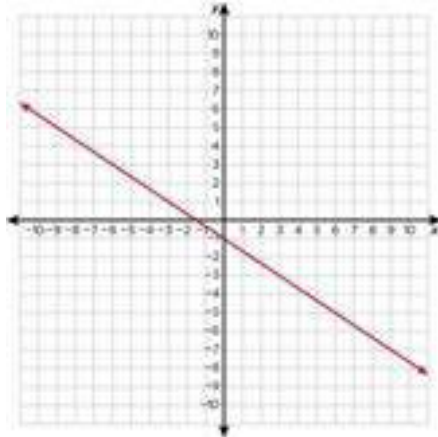
$$m = \frac{y_2 - y_1}{x_2 - x_1} \rightarrow m = \frac{(4) - (6)}{(-2) - (10)}$$

$$m = \frac{-2}{-12} = \frac{1}{6}$$

The slope of the line is $\frac{1}{6}$

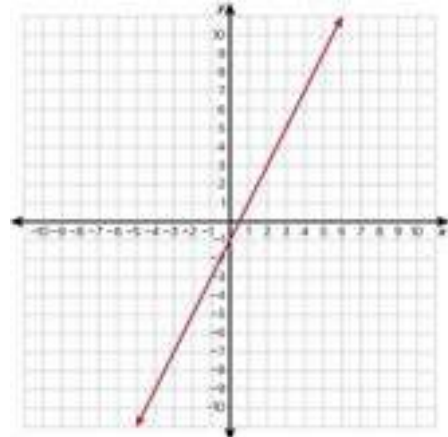
Genius Challenge

1a.



2a. $y = \frac{4}{5}x + 1$

b.



b. $y = -\frac{4}{3}x - 2$

3. Let x represent the gas used, and let y represent the distance traveled. The line passes through $(0, 0)$ so the y -intercept is 0.

Point 1 $(2, 70)$: $x_1 = 2, y_1 = 70$

Point 2 $(4, 140)$: $x_2 = 4, y_2 = 140$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{(140) - (70)}{(4) - (2)}$$

$$m = \frac{70}{2}$$

$$m = 35$$

Miguel's gas mileage is 35 miles/gallon. The equation that represents this situation is $y = 35x$.

PROBABILITY: COMPOUND EVENTS

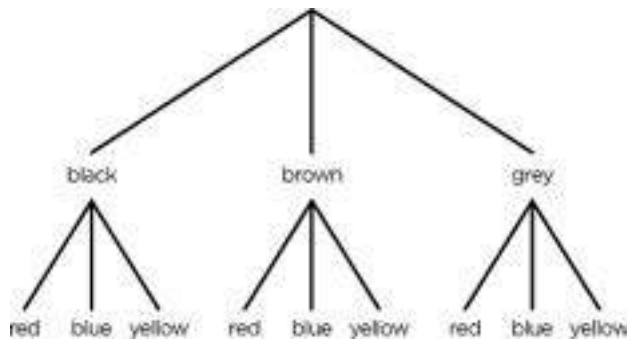
Extended Practice (Number Problems)

- 1a. $\frac{1}{4}$
- b. $\frac{1}{36}$
- c. $\frac{1}{24}$
- d. $\frac{4}{9}$
- e. $\frac{1}{3}$

Extended Practice (Word Problems)

1. $\frac{1}{6}$

2a.



b. Only 1 of the 9 outcomes has that combination, so the probability is $\frac{1}{9}$

3. Kevin is correct. On the first pick, the probability of picking a blue marble is $\frac{4}{8}$ or $\frac{1}{2}$, since there are 4 blue marbles and 8 marbles in all. However, the probability changes on the second pick. Since the blue marble from the first pick is not put back into the jar, there are now 3 blue marbles in the jar and a total of 7 marbles in the jar. So on the second pick, the probability of picking a blue marble is $\frac{3}{7}$. Multiply these two probabilities to find the probability of getting an outcome of 2 blue marbles. $\frac{1}{2} \times \frac{3}{7} = \frac{3}{14}$.

Genius Challenge

1a. $\frac{1}{4}$

b. $\frac{1}{36}$

c. $\frac{1}{24}$

2. $\frac{3}{5} \times \frac{2}{5} = \frac{6}{25}$ The probability that the first ball is red and the second ball is yellow is $\frac{6}{25}$.

3. $\frac{8}{18} \times \frac{10}{17} = \frac{80}{306} = \frac{40}{153}$ The probability that the first candy is strawberry and the second candy is lemon is $\frac{40}{153}$.

4. $\frac{5}{20} \times \frac{4}{19} = \frac{1}{4} \times \frac{4}{19} = \frac{1}{19}$ The probability that both students play basketball is $\frac{1}{19}$.

INTRO TO ALGEBRAIC EXPRESSIONS

Extended Practice (Number Problems)

- Terms: $2x, 3y, 10, -x, -2y, -4$
- Expressions: $5, 3x, y + 7$
Equations: $5 + 7 = 20 - 8, 35 + 14 =$
- Coefficients: $5, 8, 3, 1$
Variables: x, y
Constants: $7, 9$
- 10 and 5 ; $3x$ and x
 - $5c$ and $11c$
- $12x + 3$
 - $14y + 10 - 2x$
- $4x + 17$
 - $5a + 3m + 20$
- The second expression has more terms. The expressions are equivalent, but for example, $4d$ is one term and $d + d + d + d$ has four terms.

Extended Practice (Word Problems)

- $2l, 2w$
- $12p$, where p represents the number of boxes of pencil crayons
 - $12(7) = 84$ pencil crayons
- $\frac{36}{b}$, where b is the number of cupcakes in each box
 - $\frac{36}{9} = 4$ boxes
- No, like terms must have the same variable, not necessarily the same coefficient.
- $7a - 2b + 7c$
 - $14d + 6$
 - $6x + 18$
 - $3a + 2b + 5$
- Yes, all four terms are like terms, so I can combine them: $3n + 3n - 6n = 6n - 6n = 0$.

Genius Challenge

1. $x, y, 5x, 4$

2. Neither; it would be an equation if there was another expression on the right side of the equal sign, such as $3 + y$, or it would be an expression if the equal sign was not there.

3a. $5, 2$

b. $9, 7$

c. $5(1) + 2(0) + 9 - 7 = 7$

4. Yes; these expressions have the same variable.

5a. $4a + 5b$

b. $c + 5$

c. $9d + 9e + 9$

d. $3f + 4g + 8$

6a. $d + 10$

b. $24 + 10 = 34$ dogs

SCIENTIFIC NOTATION

Extended Practice (Number Problems)

1a. 1.5×10^4

b. 1.2×10^5

c. 2.75×10^6

2a. 2,000

b. 7,500

c. 525,000,000

3a. 8×10^{-3}

b. 6.4×10^{-1}

c. 1.05×10^{-4}

4a. 0.000032

b. 0.0006

c. 0.00525

5. 5×10^7

6. 9.109×10^{-31} kilogram

7. $(8.5 + 6.5) \times 10^3$

15×10^3

1.5×10^4

8. $(8 - 6.75) \times 10^4$

1.25×10^4

9. $(2 \times 4) \times (10^{99} \times 10^1)$

8×10^{100}

10. $(6 \times 10^{50}) \div (3 \times 10^{25})$

$(6 \div 3) \times (10^{50} \div 10^{25})$

2×10^{25}

PERCENT CHANGE

Extended Practice (Number Problems)

- 1a. 55
- c. 30
- e. 63
- g. 43
- 2a. 20% decrease
- b. 70% decrease
- c. approximately 46% increase
- d. approximately 33% increase
- b. 99
- d. 84.5
- f. 36
- h. 42.3

Extended Practice (Word Problems)

- 1. \$51.75
- 2. \$112.50
- 3. \$55.20
- 4. The population increased by 20%.
- 5. Club membership decreased by 50%.

Genius Challenge

- 1a. 44
- c. 36
- 2a. approximately 282% increase
- 3. Nikita will grow 18 tomato plants next year.
- 4. The card's worth increased by about 108%.
- 5. The new bear population is 114.
- b. 72
- d. 104.4
- b. approximately 58% decrease

FIND SOLUTIONS TO ALGEBRAIC INEQUALITIES

Extended Practice (Number Problems)

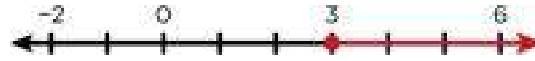
1a. $x > 4$

b. $x \leq 36$

c. $x < 5$

d. $x \geq 24$

2a. $x > 3$



b. $x \geq 12$



c. $x < 9$



3a. $x > 10$; 11, 12, 13

b. $x < 32$; 10, 15, 31

c. $x \leq 12$; 2, 10, 12

d. $x \geq 27$; 27, 28, 50

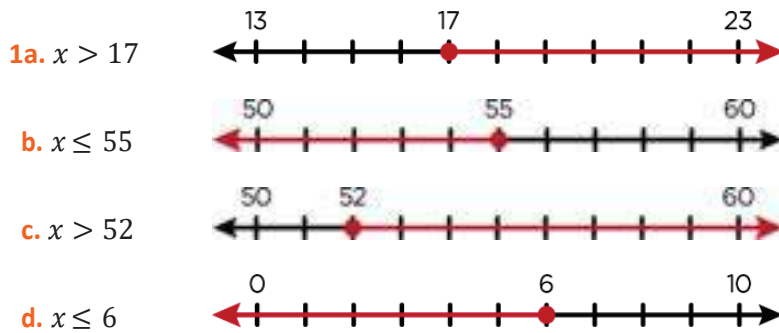
4a. $15 \geq 7$ is true; yes

b. $19 < 7$ is false; no

Extended Practice (Word Problems)

1. The roof rack must be less than 17" tall.
2. Daria can bring at most 5 friends, including herself.
3. You need to sell at least 11 cards.
4. You need to make more than \$112.
5. 25 is greater than 21, so you have enough money.

Genius Challenge



2a. $x < 17$

b. $x > 36$

c. $x \geq 11$

d. $x \leq 45$

3. They need to sell at least 25 tickets.

4. You have time to run at most 7 laps.

SOLVE ALGEBRAIC EQUATIONS (2-STEP)

Extended Practice (Number Problems)

1a. $x = 2$

c. $x = 3$

e. $x = 8$

g. $x = -2$

2a. $x = 8$

c. $x = 20$

e. $x = 3$

3a. $x = 5$

c. $x = 1$

b. $x = 2$

d. $x = 3$

f. $x = -7$

h. $x = -5$

b. $x = 18$

d. $x = -5$

f. $x = -20$

b. $x = 3$

d. $x = 15$

Extended Practice (Word Problems)

- $7x + 5 = 33$; She orders 4 burgers.
- $9x - 6 = 30$; Each croissant costs \$4.
- $\frac{x}{4} + 3 = 15$; There were 48 carrots in Bill's garden.
- $5(x + 2) = 35$; A regular ice cream costs \$5.

Genius Challenge

- | | |
|-------------|-------------|
| 1a. $x = 5$ | b. $x = 3$ |
| c. $x = 2$ | d. $x = -4$ |
| e. $x = 5$ | f. $x = 2$ |
-
- | | |
|-------------|------------|
| 2a. $x = 4$ | b. $x = 8$ |
| c. $x = 4$ | d. $x = 3$ |
-
- $3x + 8 = 53$; Ani made 15 balloon animals.
 - $7(x - 3) = 56$; The regular price is \$11.

USE ALL 4 QUADRANTS OF THE COORDINATE PLANE

Extended Practice (Number Problems)

1a. Quadrant 1

b. Quadrant 4

c. Quadrant 4

d. Quadrant 3

e. Quadrant 3

2a. Answers will vary. Both coordinates should be positive.

b. Answers will vary. The x -coordinate should be negative. The y -coordinate should be positive.

c. Answers will vary. The x -coordinate should be negative. The y -coordinate should be negative.

d. Answers will vary. The x -coordinate should be positive. The y -coordinate should be negative.

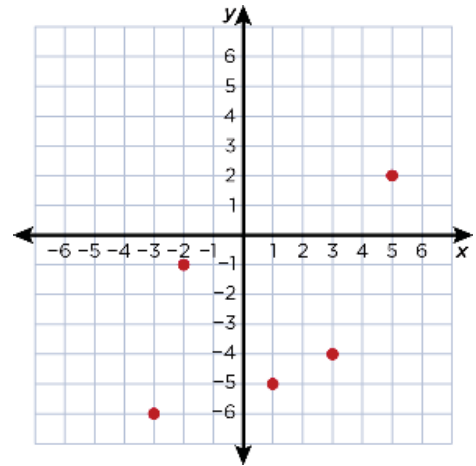
3. 11 units

4a. 10 units, 4 units

b. 28 units

c. 40 square units

5. Answers will vary. Sample answer: Points at $(-2, 3)$, $(-2, -4)$, $(2, 3)$, $(2, -4)$. Side lengths are 7 units and 4 units. Perimeter is 22 units. Area is 28 square units.

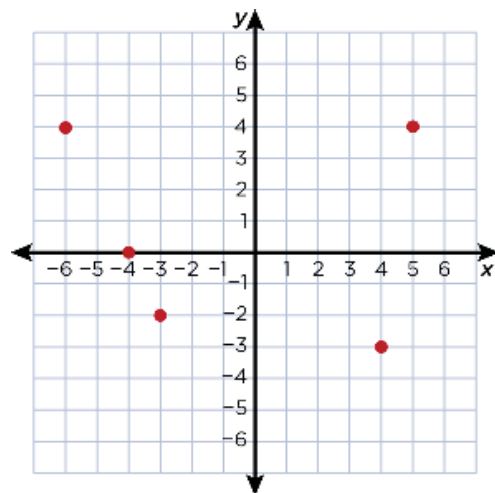


Extended Practice (Word Problems)

- 1a. $(-4, 5)$
 - b. $(-4, 2)$
 - c. $(-1, 2)$
 - d. $(0, 0)$
 - e. $(-4, -3)$
- 2a. 8 miles
- b. 3 miles
 - c. $(0, 0)$
- 3a. The working tent: $(-4, -2)$. The food tent: $(2, -2)$.
- b. 22 meters
 - c. 30 square meters

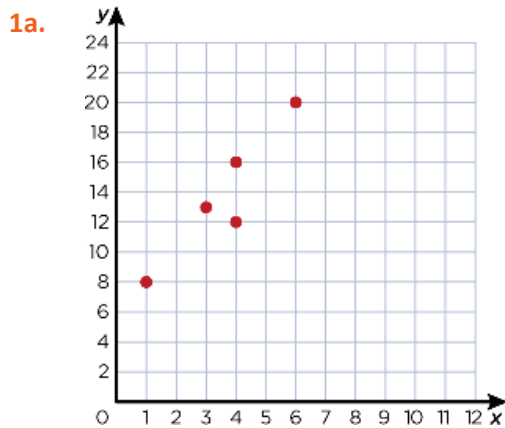
Genius Challenge

- 1a. $(2, 6)$
 - b. $(-4, 6)$
 - c. $(-3, -3)$
 - d. $(0, 2)$
 - e. $(3, -5)$
2. See image at right.
- 3a. 14 units
- b. 10 square units
 - c. 14 units
 - d. 12 square units



DISPLAYING BIVARIATE DATA (SCATTER PLOTS)

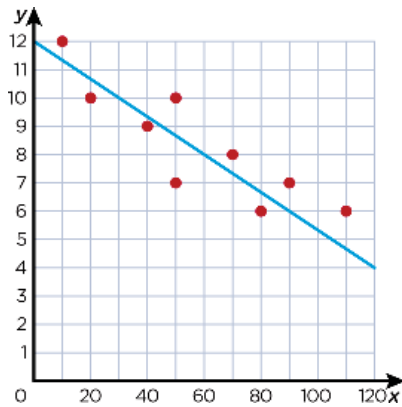
Extended Practice (Number Problems)



b. The data shows a positive association. When the number of levels played goes up, so does a player's score.

2a. The data shows a negative association. As the runners get farther into their run, they slow down.

b. Answers will vary. Sample answer shown.



c. Answers will vary.

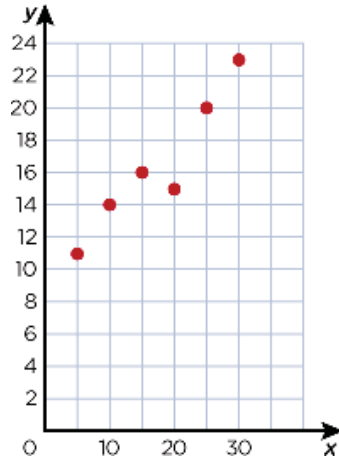
d. The association is negative, and so is the slope.

Extended Practice (Word Problems)

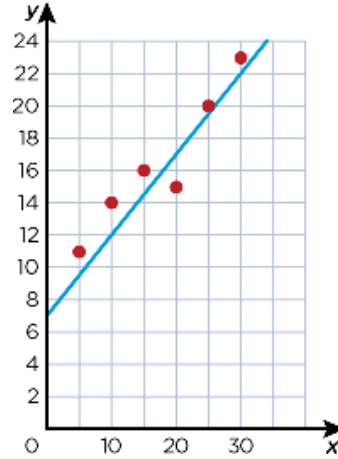
Answers for all questions here will depend on the data collected by the student.

Genius Challenge

1a.



c.

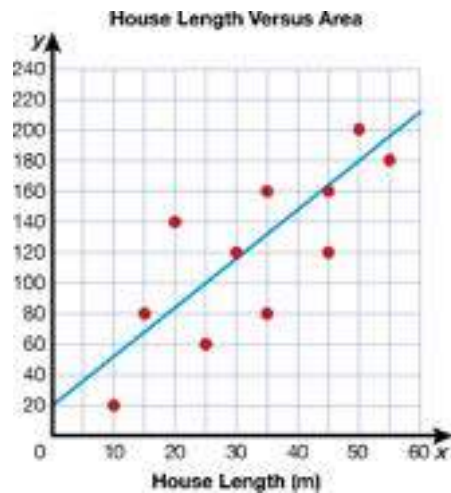


b. The data shows a positive association. More cupcakes were sold at the end of the month than the beginning.

d. The association is positive, and so is the slope.

2a. The data shows a positive association. As the square footage of a house increases, so does the length.

b. Answers will vary. Sample answer shown.

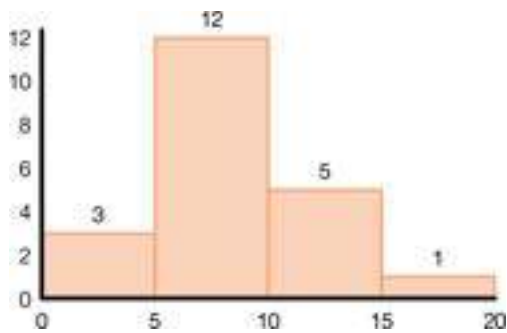


HISTOGRAMS & BOX PLOTS

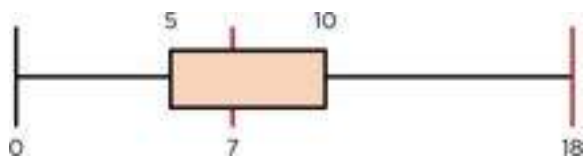
Extended Practice (Number Problems)

- 1a. Histogram; 60-70
- b. Histogram; 30
- c. Box plot; 15 and 93
- d. Histogram; It shows that there are more people in the range 10-40 than 70-100. But the answer depends on what age you consider young!
- e. Answers may vary.

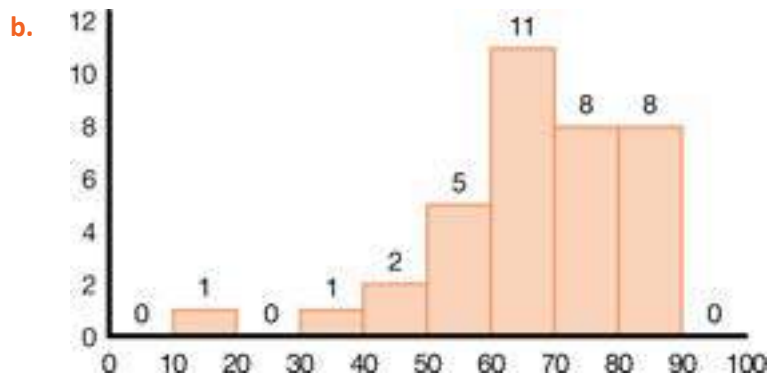
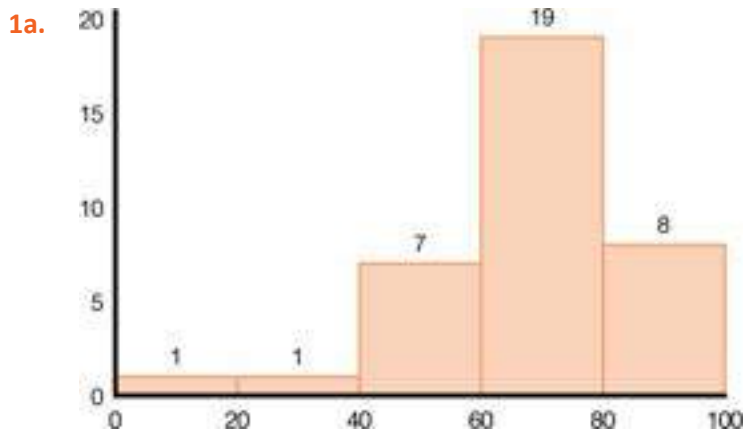
2a.



b.



Extended Practice (Word Problems)



c. Sample answer: The second histogram shows how many people passed and that no one got more than 90.

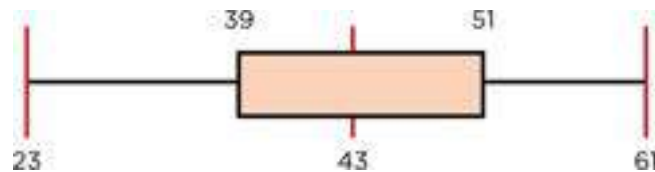
d. Sample answer: One person scored in the 10-20 range. Most students in the class passed the test, but no one scored over 90, so they did okay.

2a. 43

b. 23 and 61

c. 39, 51, 39-51.

d.



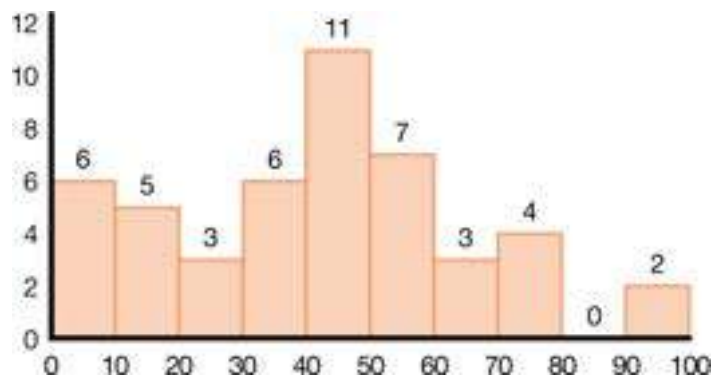
Genius Challenge

1a. 26 and 64

b. 44

c. Sample answer: I know that the data below the lower quartile and the data above the upper quartile represent the same number of people. Because the difference between 49 and 64 is greater than the difference between 26 and 34, I can conclude that the numbers are closer together below the lower quartile. Therefore, there are probably more people closer to 26 than 64.

2a. Sample answer:



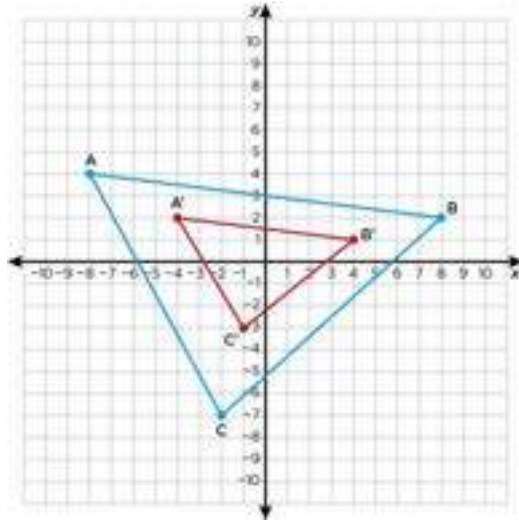
b. Yes. People between 90 and 99 (or similar, depending on bins)

c. 40-49 (or similar, depending on bins)

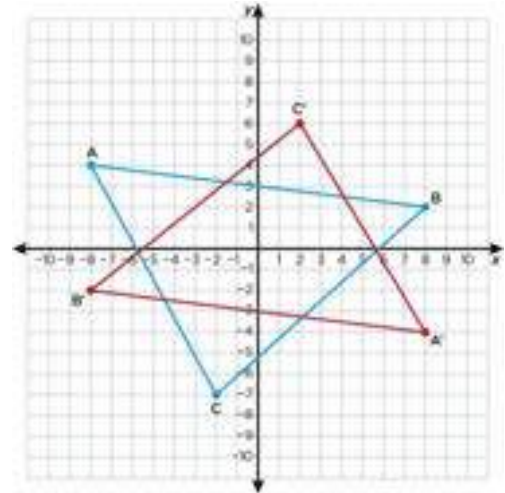
TRANSFORMATIONS ROTATIONS & DILATIONS

Extended Practice (Number Problems)

1.

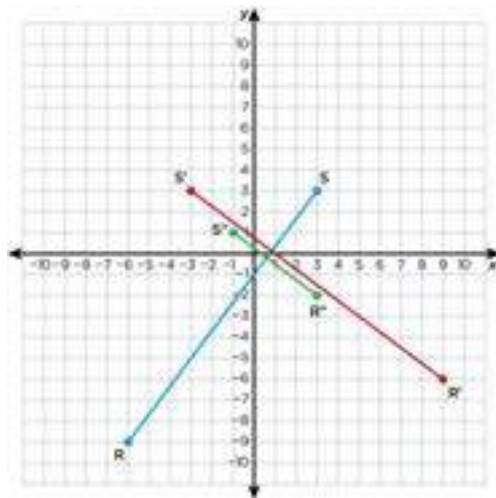


2.



3. A rotation of 90° clockwise about the origin was used to obtain the image. I know this because each endpoint moves one quadrant clockwise. I also know this because the coordinates of the corresponding points follow the rule $(x, y) \rightarrow (y, -x)$. This is the mapping rule for a 90° clockwise rotation.

4.

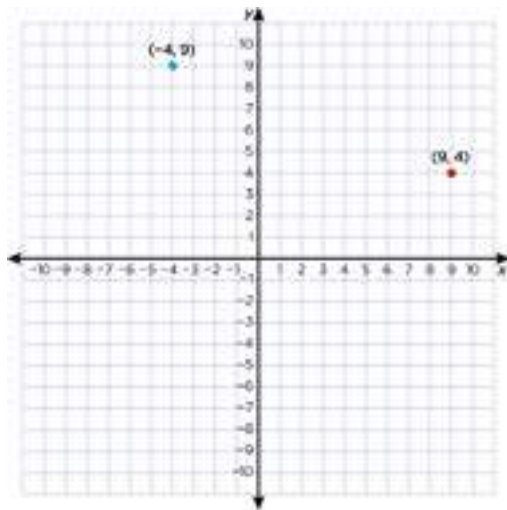


Extended Practice (Word Problems)

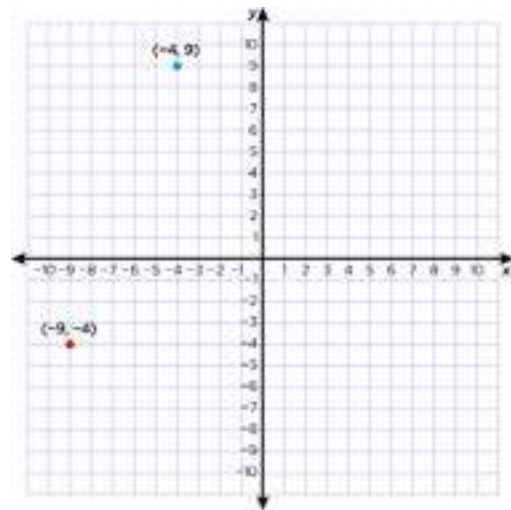
1. Janelle is correct. Both Janelle and Marcos have provided images of a 90° rotation. The difference is that Janelle's image is for a clockwise rotation, and Marcos' is for a counterclockwise rotation.
2. Performing the dilation on a rectangle gives the image rectangle side lengths that are 6 times as long as those in the original rectangle.
3. Dominic is correct. When combining transformations, we need to follow the order of transformations. The order is rotations, reflections, dilations, and then translations.
4. Answers will vary.

Genius Challenge

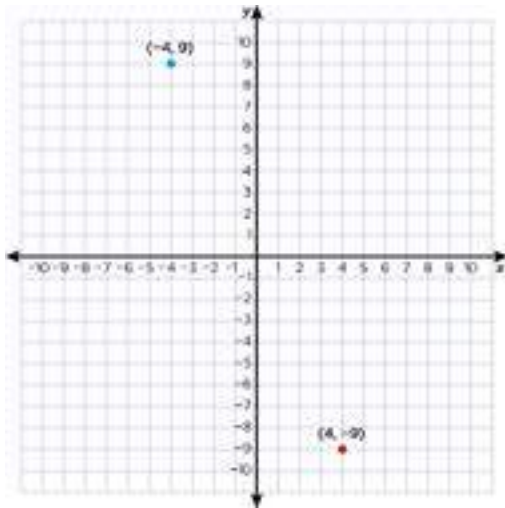
1a.



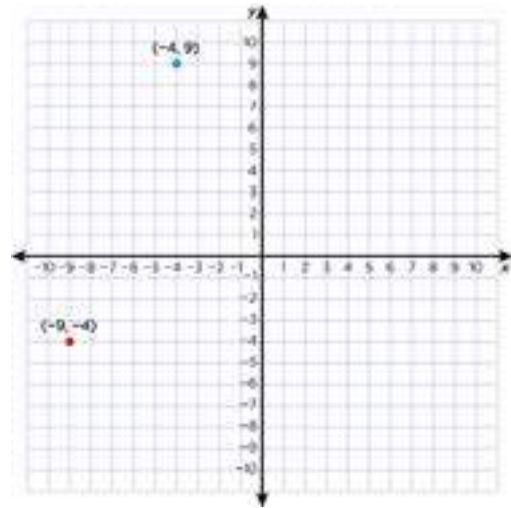
b.



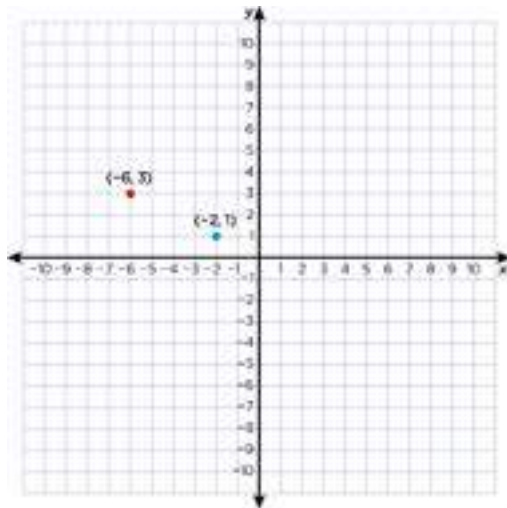
c.



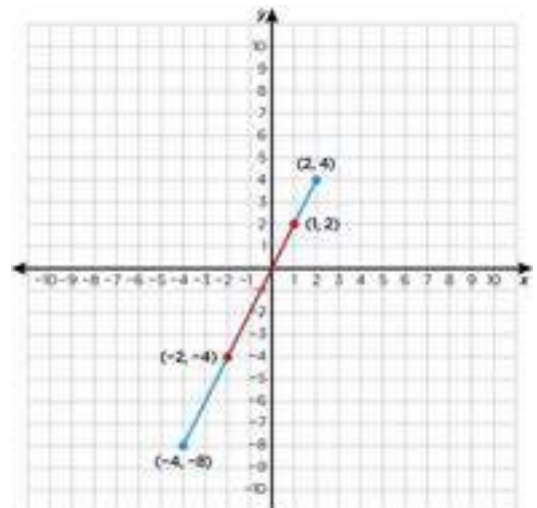
d.



2a.



b.

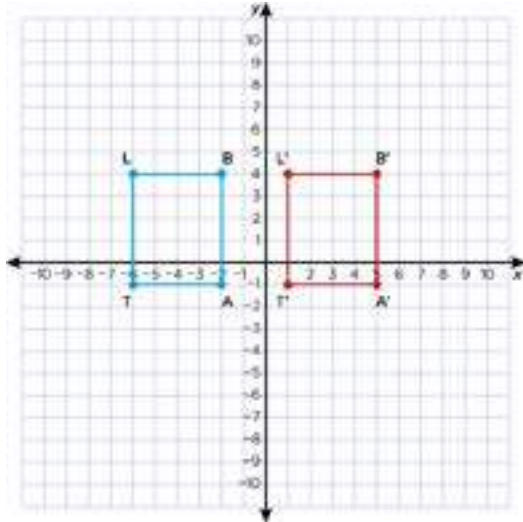


3. For two shapes to be congruent they must have all the same angles and all the same side lengths in all the same places. For two shapes to be similar, they must have all the same angles in all the same places, and the side lengths must all share a scale factor. Because dilations change the side lengths in a figure, but not the angles within the figure, Marian is correct, dilated figures are similar, not congruent.

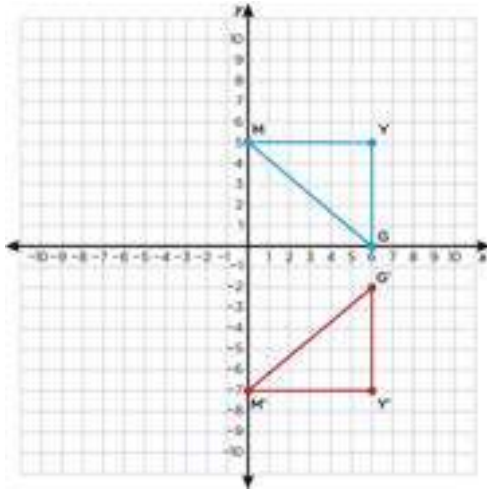
TRANSFORMATIONS: REFLECTIONS & TRANSLATIONS

Extended Practice (Number Problems)

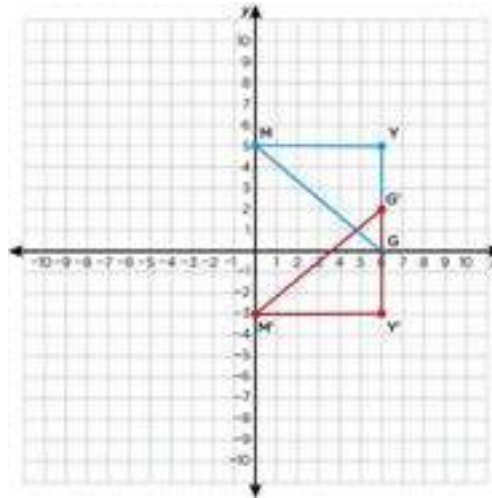
1. $T'(1, -1)$, $A'(5, -1)$, $B'(5, 4)$, $L'(1, 4)$



- 2a. $G'(6, -2)$, $Y'(6, -7)$, and $M'(0, -7)$

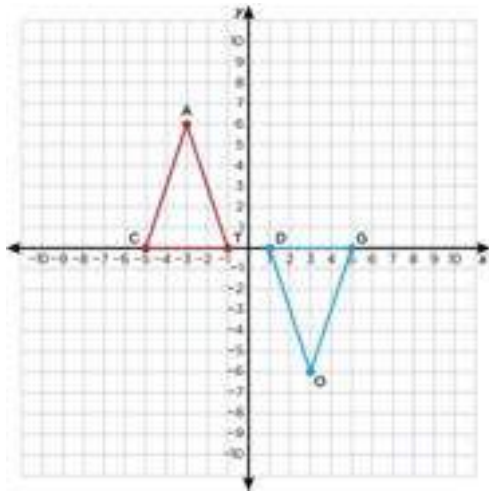


- b. $G'(6, 2)$, $Y'(6, -3)$, and $M'(0, -3)$



- c. The order does matter. The results are not the same.

3. Possible answer: Reflect over the y -axis, then reflect over the x -axis.

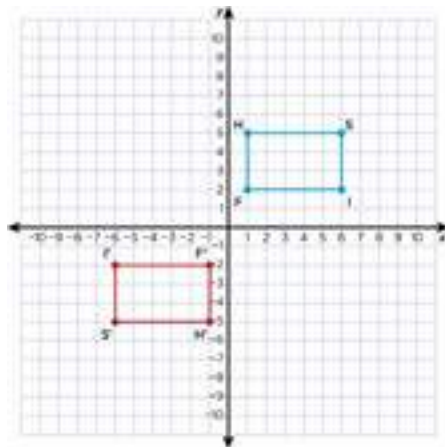


4. Mya is correct. Triangle TRI can be translated 6 units right and 4 units down to exactly match triangle T'R'I'.

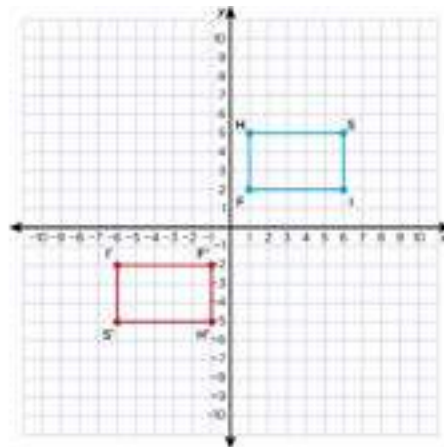
Extended Practice (Word Problems)

1. Translate 7 units down and 9 units to the right.

2.



Reflect over the x -axis, then reflect over the y -axis.



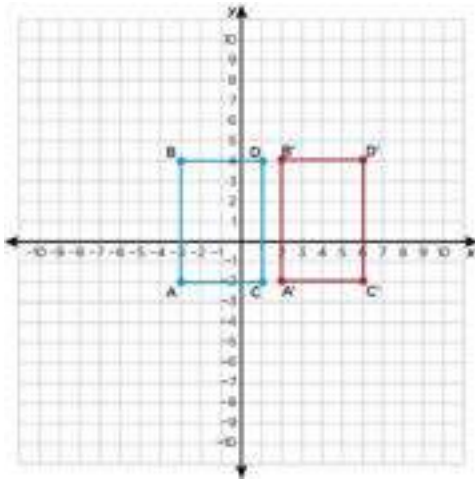
Reflect over the y -axis, then reflect over the x -axis.

Brian is not correct. Each reflection results in one of the coordinates of each vertex changing to its opposite, so the results are the same.

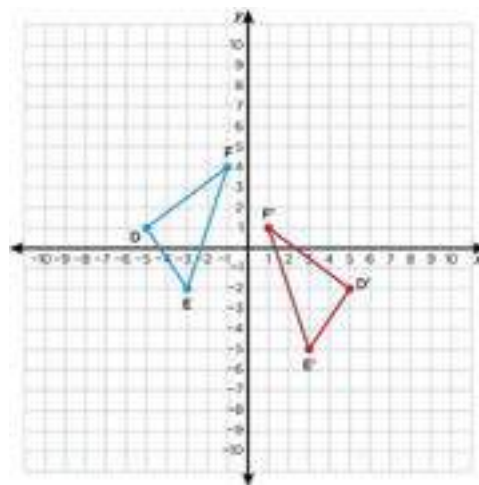
3. No, there is no sequence of translations and reflections that exactly maps triangle ABC onto triangle A'B'C', because the sides of triangle A'B'C' are shorter.
4. Possible answer: Translate 10 units left and 10 units down, then reflect over the y -axis.

Genius Challenge

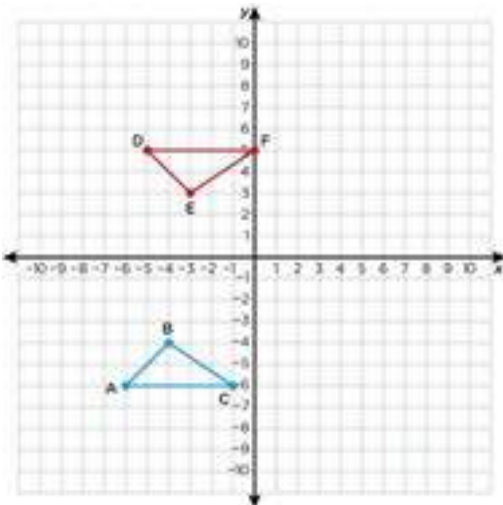
1. $A'(2, -2)$, $B'(2, 4)$, $C'(6, -2)$, $D'(6, 4)$



2. $D'(5, -2)$, $E'(3, -5)$, and $F'(1, 1)$



3. Possible answer: Reflect triangle ABC over the x-axis, and then translate the image 1 unit to the right and 1 unit down.



4. Joe is correct. Translate triangle ABC 6 units left and 2 units up to exactly match triangle A'B'C'.

MEAN, MEDIAN & MODE

Extended Practice (Number Problems)

- 1a. Mean: 20; median: 15, mode: 7
- 1b. Mean: 54.2; median: 39; mode: 85
- 1c. Mean: 35; median: 35; mode: 32
- 1d. Mean: 70.5; median: 65; mode: 60
- 1e. Mean: 2.2; median: 2.0; mode: 2.0
- 1f. Mean: 6; median: 6.1; mode: 6.3

Extended Practice (Word Problems)

1. The mean number of books read is 11. I found the mean by finding the total of all of the numbers in the data set. Then I divided that number by 7, the number of friends that Josiah interviewed.
2. The median is 6.5 laps around the track. Sample answer: I think this is a good measure of center because there is an outlier, 12, in this set of data. When there are outliers it is best to use the median rather than the mean because outliers significantly affect the mean.
3. The band that is the mode is the Queen Bees. The Queen Bees band was named 6 times, which is more than any other band.
4. Mean: 675 km; median: 645 km; mode: 564 km

Genius Challenge

- 1a. Mean: 52; median: 64; mode: 64
 - 1b. Mean: 52; median: 58; mode: 58
 - 1c. Mean: 31; median: 30; mode: 40
 - 1d. Mean: 3.8; median: 3.6; mode: 3.5
2. Mean: \$19; median: \$19; mode: 25
 3. Mean: 88.5; median: 87.5; mode: 85

LONG DIVISION (STANDARD ALGORITHM FOR DIVISION)

Extended Practice (Number Problems)

1a. 23

c. 109

e. 122

g. 3

i. 52

k. 633

2a. 144 R 2

Remainder 2

$$144 \times 5 = 720. 720 + 2 = 722.$$

b. 76

d. 68

f. 1,052 R2

h. 14

j. 36

l. 450

b. 79 R 11

Remainder 11

$$79 \times 18 = 1,422. 1,422 + 11 = 1,433.$$

Extended Practice (Word Problems)

1. 687 tons of dirt
2. 825 calories per meal
3. 38 laps per day
4. \$129 per day
5. 18 days

Genius Challenge

1a. 27

c. 154

e. 3

g. 421

2. 488 dolls

3. 78

4. 32 desks in each classroom. No desks left over (remainder 0).

5. 34 desks in each classroom. 2 desks left over (remainder 2)

b. 101

d. 842

f. 10

h. 321

PYTHAGOREAN THEOREM

Extended Practice (Number Problems)

- 1a. 10 inches
- c. 24 feet
- 2a. $50^2 + 50^2 = c^2$
- 3. 13 inches
- 4. 21 feet
- 5. Yes, because $30^2 + 40^2 = 50^2$.
- b. 8.06 inches
- d. 13.86 m
- b. 70.7 feet

Extended Practice (Word Problems)

- 1. 81 feet
- 2. No, because $6^2 + 10^2 \neq 13^2$.
- 3. $4 + \sqrt{4^2 + 9^2} + 9 \approx 22.8$ blocks

Genius Challenge

- 1a. 13.45 units
- 2a. 14 units
- 3. Yes, because $15^2 + 20^2 = 25^2$.
- b. 7.21 units
- b. 20 units

UNIT RATES

Extended Practice (Number Problems)

- 1a. 9 to 1
c. \$5.50 to 1

- 2a. 60 miles per hour
c. 30 people per class

- 3a. $22.75 \div 7 = \$3.25$ per bar
 $44.00 \div 11 = \$4.00$ per bar
Candy bar A is the better deal.

- b. 100 to 1
d. $\frac{5}{4}$ to 1

- b. 8 people per group
d. 5 cups of flour per 1 cup of sugar

- b. $275 \div 100 = \$2.75$ per loaf
 $487.50 \div 150 = \$3.25$ per loaf
Loaf of bread A is the better deal.

Extended Practice (Word Problems)

1. The rate is 300 miles in 6 hours, or $\frac{300}{6}$.

$$\frac{300}{6} \div \frac{6}{6} = \frac{50}{1}$$

The unit rate is 50 miles per hour.

2. The rate is \$22.75 for 7 baseball caps.
Divide \$22.75 by 7 to find the unit rate.
 $22.75 \div 7 = 3.25$
The unit rate is \$3.25 per baseball cap.

3. Tony's Sewing Store:
Divide \$112.50 by 9 to find the unit rate. $\$112.50 \div 9 = \12.50 . The unit rate is \$12.50 per yard.

Latika's Sewing Store:

Divide \$260 by 20 to find the unit rate. $\$260 \div 20 = \13 . The unit rate is \$13.00 per yard.

Tony's Sewing Store has the better deal.

4. Divide 47 by 23.5 to find the unit rate.
 $47 \div 23.5 = 2$; Keisha works 2 hours per day.
 $50 \times 2 = 100$; Keisha works 100 hours in 50 days.

5. Water leaks at the rate of $2\frac{1}{2}$ liters of water in $\frac{1}{4}$ hour.

$$2\frac{1}{2} : \frac{1}{4}$$

Find the unit rate:

$$2\frac{1}{2} \div \frac{1}{4} = \frac{5}{2} \times 4 = \frac{20}{2} = 10$$

Water leaks at the unit rate of 10 liters every hour.

Water leakage in 12 hours:

$$10 \times 12 = 120$$

In 12 hours, the faucet leaks 120 liters.

Genius Challenge

1a. 2 to 1

b. 8 to 1

2a. \$0.40 per apple

b. $5\frac{1}{4}$ inches of rain per day

c. 40 hours of work per week

d. 10 cups of flour per 1 cup of sugar

3. Distributor A:

Divide 300 by 20 to find the unit rate. $\$300 \div 20 = \15.00 . The unit rate is \$15.00 per robot.

Distributor B:

Divide \$464 by 32 to find the unit rate. $\$464 \div 32 = \14.50 . The unit rate is \$14.50 per robot.

Distributor B has the better deal.

4. The ratio of markers to minutes is $5 : 2\frac{1}{4}$, or $5 : \frac{9}{4}$

$$5 \div \frac{9}{4} = 5 \times \frac{4}{9} = \frac{20}{9} = 2\frac{2}{9}$$

The unit rate of markers to minutes is $\frac{20}{9}$ markers per 1 minute.

$$\frac{20}{9} \times 45 = 100 \text{ markers}$$

The machine can make 100 markers in 45 minutes.

INTRO TO RATIOS

Extended Practice (Number Problems)

1 a.

5 shaded : 4 unshaded

4 unshaded : 5 shaded

$\frac{5}{9}$ shaded

$\frac{4}{9}$ unshaded

b.

8 shaded : 7 unshaded

7 unshaded : 8 shaded

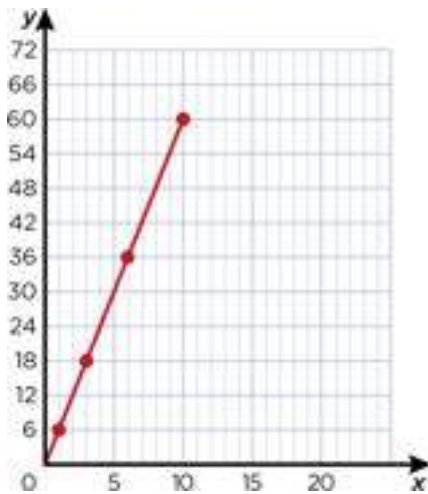
$\frac{8}{15}$ shaded

$\frac{7}{15}$ unshaded

2. 11 red marbles : 4 blue marbles

3. The second deal is better by 1 can per \$1.

4.



When there are 10 tables, there are 60 chairs.

Extended Practice (Word Problems)

1a. 12 : 8

b. $\frac{12}{40}$

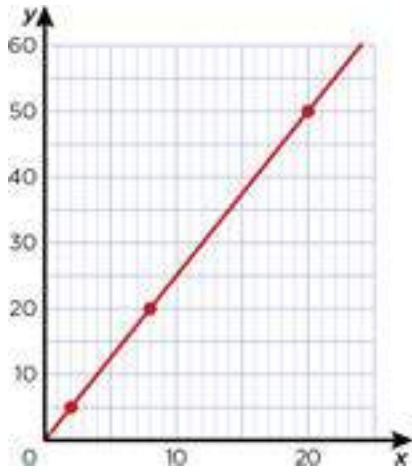
2. 6 ounces; 30 ounces

3. 50 : 17

4. 230 students + 10 teachers = 240 people

5.

Number of sculptures	2	8	20
Number of paintings	5	20	50



Genius Challenge

1. 6 shaded : 3 unshaded ; 3 unshaded : 6 shaded ; $\frac{6}{9}$ shaded; $\frac{3}{9}$ unshaded

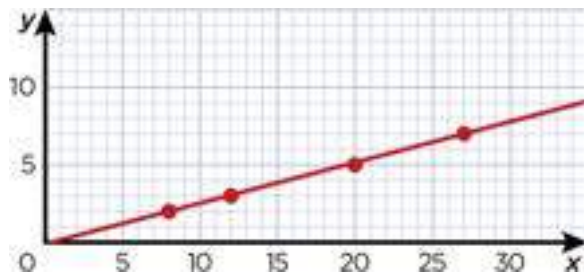
2. 7 chickens : 4 pigs

3. 4 cups; $\frac{2}{3}$ cup

4a.

Days worked	8	20	28
Days off	2	5	7

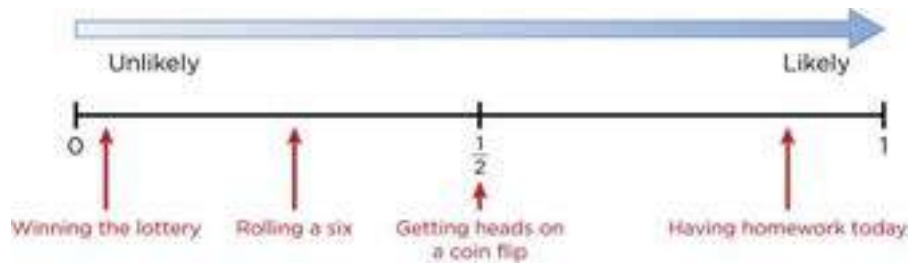
b.



PROBABILITY SINGLE EVENTS

Extended Practice (Number Problems)

1.



2a. $\frac{12 \text{ face cards}}{52 \text{ total cards}} = \frac{12}{52} = \frac{3}{13} \approx 0.23$

b. $\frac{2 \text{ ways to roll "one or two"}}{6 \text{ outcomes to a roll}} = \frac{2}{6} = \frac{1}{3} \approx 0.33$

c. $\frac{4 \text{ "seven" cards}}{52 \text{ total cards}} = \frac{4}{52} = \frac{1}{13} \approx 0.077$

d. $\frac{10 \text{ red balls}}{30 \text{ total balls}} = \frac{10}{30} = \frac{1}{3} \approx 0.33$

3a. $\frac{5}{10} = \frac{1}{2} = 0.5$

b. $\frac{7}{12} \approx 0.58$

c. $\frac{14}{20} = \frac{7}{10} = 0.7$

d. $\frac{5}{40} = \frac{1}{8} = 0.125$

Extended Practice (Word Problems)

1. Sample answer: The Law of Large Numbers describes the relationship between experimental and theoretical probability, as it relates to the number of trials in an experiment. Because every trial is an independent chance event, the outcome of each trial does not depend on the outcome of previous trials. This means that in experiments with a small number of trials, the experimental probability is farther from the theoretical probability. In experiments with a large number of trials, the experimental probability is closer to the theoretical probability.

2a.

# of cards in the deck	50
# of protection cards	3
# of explosion cards	5

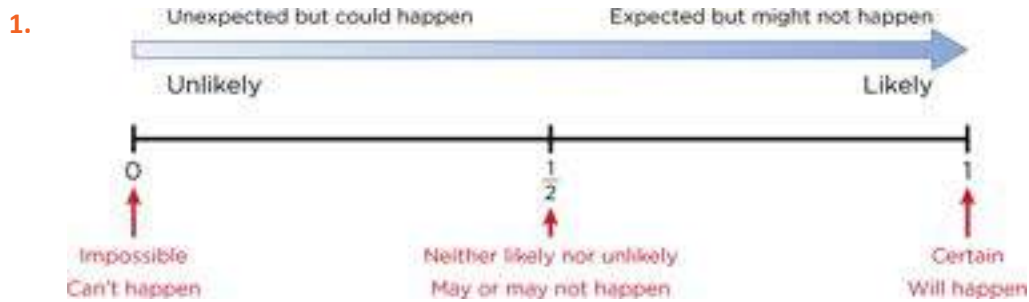
b. Since it is the first draw, all the cards are still in the deck. There are 3 protection cards, and 50 total cards, so the probability of drawing a protection card is $\frac{3}{50} = 0.06$.

c. Since it is the first draw, all the cards are still in the deck. There are 5 explosion cards, and 50 total cards, so the probability of drawing an explosion card is $\frac{5}{50} = \frac{1}{10} = 0.1$.

d. Since none of the explosion cards have been drawn, I know there are still 5 explosion cards in the draw pile. I also know that there are now 25 cards in the draw pile. This means the probability of drawing an explosion card is $\frac{5}{25} = \frac{1}{5} = 0.2$.

e. I calculated the probability based on the number of outcomes in the event, divided by the total number of outcomes possible. This means I calculated theoretical probabilities.

Genius Challenge



2a. $\frac{40 \text{ numbered cards}}{52 \text{ total cards}} = \frac{40}{52} \approx 0.77$

b. $\frac{3 \text{ ways to roll}}{6 \text{ outcomes to a roll}} = \frac{3}{6} = \frac{1}{2} = 0.5$

c. $\frac{1 \text{ section is red}}{4 \text{ total sections}} = \frac{1}{4} = 0.25$

3. $\frac{17}{20} = 0.85$. The experimental probability is 85%.

4a. There are 4 cards with the number 3, one of each suit. There are 52 cards in all. The theoretical probability is $\frac{4}{52}$. That is approximately 0.08, or 8%.

b. $\frac{8}{50} = 0.16$, or 16%.

c. The theoretical probability is a lot lower than the experimental probability, so a 3 is drawn more frequently than expected. I expect that as Tyrone runs more trials, the number of 3s drawn should get closer to being 8% of the total cards drawn.

STANDARD ALGORITHM WITH DECIMALS (ALL 4 OPERATIONS)

Extended Practice (Number Problems)

- | | |
|----------------------|----------------------|
| 1a. 58.9 | b. 25.27 |
| c. 5.889 | d. 37.361 |
| e. 60.15 | f. 1157.15 |
| | b. 50.64 |
| 2a. 113.2 | d. 60.925 |
| c. 17.73 | f. 370.511 |
| e. 331.13 | b. 16; 12.045 |
| 3a. 12; 13.86 | d. 50; 52.186 |
| c. 10; 8.28 | f. 60; 64.206 |
| e. 3; 1.82 | b. 4.6 |
| 4a. 7.2 | d. 2.06 |
| c. 10.5 | f. 5.5 |
| e. 5.6 | |

Extended Practice (Word Problems)

- 8.38 miles
- 22.684 minutes
- 2.125 chapters
- 6.4 times
- 8.6 bricks

Genius Challenge

- | | |
|-------------------------------|------------------|
| 1a. 19.36 | b. 27.16 |
| c. 6.18 | d. 36.318 |
| e. 6.40 or 6.4 | f. 58.04 |
| 2a. 4.48 | b. 16.848 |
| c. 19.712 | d. 35.912 |
| 3a. 1.8 | b. 2.13 |
| c. 12.3 | d. 9.8 |
| 4. 2.9 kilometers | |
| 5. 46.08 balls of yarn | |

MULTIPLY & DIVIDE WITH NEGATIVE NUMBERS

Extended Practice (Number Problems)

- | | | |
|---------|--------|--------|
| 1a. -50 | b. -60 | c. -14 |
| d. -36 | e. 15 | f. 36 |
| 2a. -6 | b. -40 | c. 9 |
| d. 5 | e. -5 | f. -4 |

3. Example: I lost 3 pounds a week for 5 weeks for a total of 15 pounds, or a change in my weight of -15 pounds.
4. My three friends and I borrowed \$100, a debt which is represented by -100. We each owe the same amount, \$25 which is represented by -25.
5. Positive

Extended Practice (Word Problems)

- 1a. $(-4) \times 12$
- b. -48 dollars
2. B
3. B
4. Example: The football team got 5 ten-yard penalties during the game. What is the total change in yards caused by the penalties during the game.
5. Example: The plane descended 200 feet in two minutes. How much did it descend per minute?

Genius Challenge

- | | |
|--------|--------|
| 1a. 15 | b. 72 |
| c. 32 | d. -27 |
| 2a. 9 | b. -6 |
| c. -6 | d. 3 |
3. Both numbers have the same sign.
4. The numbers have different signs.
5. $(-120) \div 3 = -40$
6. $(-2) \times (-10) = 20$. The team gained back 20 yards after the referee call.

INTRO TO NEGATIVE NUMBERS

Extended Practice (Number Problems)

- | | | |
|--------|-----------|-------|
| 1a. -3 | b. -6 | c. -5 |
| 2a. 6 | b. 3 | c. 1 |
| 3a. < | b. > | c. > |
| d. > | e. = | f. < |
| 4a. -1 | b. $ -2 $ | |
| 5a. -5 | b. 100 | |
| c. -20 | d. 0 | |

Extended Practice (Word Problems)

1. -25
2. Mark's, because $-10 < -5$.
3. Nancy's, because $-35 < -25$.
4. Alicia
5. Nicole, because Olivia thought of -13 rather than its absolute value and put negative numbers on the positive side of the number line.
6. Least: -15; greatest: 20.

Genius Challenge

1. Answers vary, ex. $-15 < -9$.
- 2a. < b. < c. >
3. $-10 < -7 < 0 < 8 < 14$
4. $9 > 3 > 0 > -6 > -12$
5. Least: -15; greatest: 32.
6. $|-150|$

Whole Number Exponents

Extended Practice (Number Problems)

1a. $2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32$

c. $10^4 = 10 \times 10 \times 10 \times 10 = 10,000$

e. $8^1 = 8$

2a. $3 \times 3 \times 3 \times 3 \times 3 = 3^6 = 729$

c. $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$
 $= 2^{10} = 1024$

e. $11 = 11^1 = 11$

3a. $5^2 \times 5^7 = 5^{2+7} = 5^9$

c. $\frac{10^8}{10^7} = 10^{8-7} = 10^1 = 10$

4a. $\frac{2^6 \times 5}{2^4} = 20$

c. $(2^2)^3 \times (2^2 - 3) + 2^2 \times 2^3 = 96$

b. $3^2 = 3 \times 3 = 9$

d. $4^4 = 4 \times 4 \times 4 \times 4 = 1$

f. $7^2 = 7 \times 7 = 49$

b. $5 \times 5 \times 5 = 5^3 = 125$

d. $6 \times 6 = 6^2 = 36$

f. $4 \times 4 \times 4 \times 4 \times 4 \times 4 = 4^6 = 4096$

b. $\frac{3^6}{3^2} = 3^{6-2} = 3^4$

d. $(3^2)^3 = 3^{2 \times 3} = 3^6 = 729$

b. $5^2 + 5^1 \times 2^3 \times 2^2 - 14 = 171$

d. $5^3 + (2 + 1)^2 \times 3^2 - 3^2 = 197$

Extended Practice (Word Problems)

1. $3^6 = 729$ points

2. $5^4 = 625$ flowers

3. $4^2 \times 4^4 = 4^6 = 4096$ birds

4. $\frac{2^{12}}{2^7} = 2^5 = 32$ times greater

5. $2^{10} = 1024$ and $10^3 = 1000$. Prize A is \$24 more.

Genius Challenge

1a. $2^7 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 128$

c. $1^9 = 1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1 = 1$

2a. $4 \times 4 \times 4 = 4^3 = 64$

c. $10 \times 10 \times 10 \times 10 \times 10 \times 10 = 10^6 = 1,000,000$

3a. $1^6 \times 1^{14} = 1^{6+14} = 1^{20}$

c. $\frac{5^5}{5^3} = 5^{5-3} = 5^2 = 25$

e. $(4^2)^1 = 4^{2 \times 1} = 4^2 = 16$

4a. $(5^2)^3 = 5^6 = 15,625$

b. $5^2 \times 5^4 = 5^6 = 15,625$

b. $3^2 = 3 \times 3 = 9$

d. $7^3 = 7 \times 7 \times 7 = 343$

b. $5 \times 5 \times 5 = 5^3 = 125$

d. $6 \times 6 = 6^2 = 36$

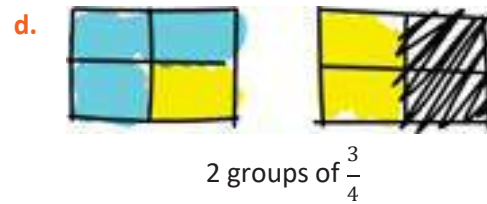
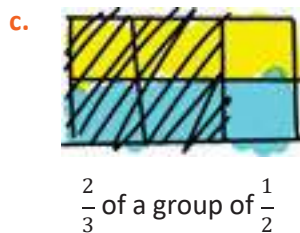
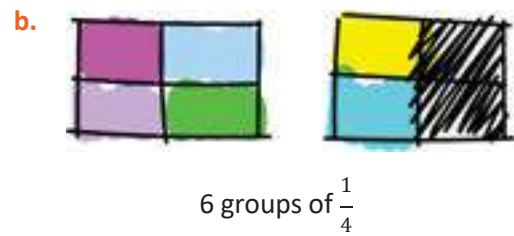
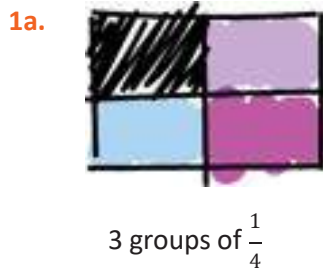
b. $8^2 \times 8 = 8^{2+1} = 8^3 = 512$

d. $\frac{3^{10}}{3^6} = 3^{10-6} = 3^4 = 81$

f. $(2^3)^3 = 2^{3 \times 3} = 2^9 = 512$

Dividing Fractions by Fractions

Extended Practice (Number Problems)



2a. $\frac{1}{2} \div \frac{1}{4} = \frac{1}{2} \times \frac{4}{1} = \frac{4}{2} = 2$

c. $\frac{3}{5} \div \frac{1}{5} = \frac{3}{5} \times \frac{5}{1} = \frac{15}{5} = 3$

e. $\frac{2}{3} \div \frac{1}{3} = \frac{2}{3} \times \frac{3}{1} = \frac{6}{3} = 2$

g. $\frac{2}{3} \div \frac{1}{4} = \frac{2}{3} \times \frac{4}{1} = \frac{8}{3} = 2\frac{2}{3}$

3a. $1\frac{1}{3} \div \frac{1}{5} = \frac{4}{3} \div \frac{1}{5} = \frac{4}{3} \times \frac{5}{1} = \frac{20}{3} = 6\frac{2}{3}$

c. $1\frac{2}{5} \div \frac{4}{5} = \frac{7}{5} \div \frac{4}{5} = \frac{7}{5} \times \frac{5}{4} = \frac{35}{20} = \frac{7}{4} = 1\frac{3}{4}$

e. $2\frac{3}{4} \div 3\frac{1}{2} = \frac{11}{4} \div \frac{7}{2} = \frac{11}{4} \times \frac{2}{7} = \frac{22}{28} = \frac{11}{14}$

b. $\frac{1}{4} \div \frac{1}{2} = \frac{1}{4} \times \frac{2}{1} = \frac{2}{4} = \frac{1}{2}$

d. $\frac{1}{2} \div \frac{3}{5} = \frac{1}{2} \times \frac{5}{3} = \frac{5}{6}$

f. $\frac{4}{3} \div \frac{1}{6} = \frac{4}{3} \times \frac{6}{1} = \frac{24}{3} = 8$

h. $\frac{4}{5} \div \frac{3}{5} = \frac{4}{5} \times \frac{5}{3} = \frac{20}{15} = 1\frac{5}{15} = 1\frac{1}{3}$

b. $\frac{2}{3} \div 2\frac{1}{4} = \frac{2}{3} \div \frac{9}{4} = \frac{2}{3} \times \frac{4}{9} = \frac{8}{27}$

d. $1\frac{1}{6} \div 2\frac{2}{3} = \frac{7}{6} \div \frac{8}{3} = \frac{7}{6} \times \frac{3}{8} = \frac{21}{48} = \frac{7}{16}$

f. $3\frac{1}{2} \div 2\frac{2}{3} = \frac{7}{2} \div \frac{8}{3} = \frac{7}{2} \times \frac{3}{8} = \frac{56}{16} = \frac{28}{8} = 9\frac{1}{3}$

Extended Practice (Word Problems)

1. $\frac{3}{4} \div \frac{1}{8} = \frac{3}{4} \times \frac{8}{1} = \frac{24}{4} = 6$

6 people can eat.

2. $\frac{1}{2} \div \frac{1}{7} = \frac{1}{2} \times \frac{7}{1} = \frac{7}{2} = 3\frac{1}{2}$

You can fit $3\frac{1}{2}$ rugs.

3. $4\frac{1}{2} \div \frac{3}{4} = \frac{9}{2} \div \frac{3}{4} = \frac{9}{2} \times \frac{4}{3} = \frac{36}{6} = 6$

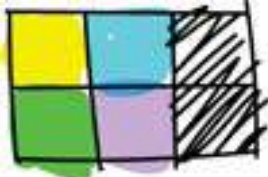
6 people will finish the pizzas.

4. $5\frac{1}{3} \div \frac{2}{3} = \frac{16}{3} \div \frac{2}{3} = \frac{16}{3} \times \frac{3}{2} = \frac{48}{6} = 8$

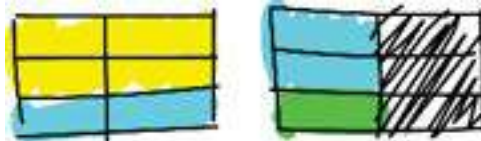
You can plant 8 zucchini plants.

5. $6\frac{2}{3} \div 1\frac{1}{4} = \frac{20}{3} \div \frac{5}{4} = \frac{20}{3} \times \frac{4}{5} = \frac{80}{15} = 5\frac{5}{15} = 5\frac{1}{3}$ You will be able to bake 5 cakes, because you can't bake $\frac{1}{3}$ of a cake.

Genius Challenge

1a. 

$$\frac{2}{3} \div \frac{1}{6} = \frac{2}{3} \times \frac{6}{1} = \frac{12}{3} = 4$$

b. 

$$1\frac{1}{2} \div \frac{2}{3} = \frac{3}{2} \times \frac{3}{2} = \frac{9}{2} = 4\frac{1}{2}$$

2a. $\frac{1}{5} \div \frac{2}{3} = \frac{1}{5} \times \frac{3}{2} = \frac{3}{10}$

b. $\frac{5}{6} \div \frac{1}{6} = \frac{5}{6} \times \frac{6}{1} = \frac{30}{6} = 5$

c. $\frac{4}{5} \div \frac{4}{7} = \frac{4}{5} \times \frac{7}{4} = \frac{28}{20} = \frac{7}{5} = 1\frac{2}{5}$

d. $1\frac{3}{4} \div \frac{2}{3} = \frac{7}{4} \times \frac{3}{2} = \frac{21}{8} = 2\frac{5}{8}$

e. $3\frac{3}{5} \div 1\frac{1}{5} = \frac{18}{5} \div \frac{6}{5} = \frac{18}{5} \times \frac{5}{6} = \frac{90}{30} = 3$

f. $2\frac{1}{4} \div 1\frac{4}{5} = \frac{9}{4} \div \frac{9}{5} = \frac{9}{4} \times \frac{5}{9} = \frac{45}{36} = \frac{5}{4} = 1\frac{1}{4}$

3. $\frac{5}{6} \div \frac{1}{8} = \frac{5}{6} \times \frac{8}{1} = \frac{40}{6} = \frac{20}{3} = 6\frac{2}{3}$ 6 and $\frac{2}{3}$ of a tile.

4. $5\frac{1}{4} \div \frac{3}{4} = \frac{21}{4} \div \frac{3}{4} = \frac{21}{4} \times \frac{4}{3} = \frac{84}{12} = 7$ 7 people ate the cinnamon buns.

Volume of Cylinders, Cones & Spheres

Extended Practice (Number Problems)

- 1a. 226.08 cm^3
- c. 20.93 m^3
- e. 209.33 cm^3
- b. 113.04 m^3
- d. 188.4 m^3
- f. $1,436.03 \text{ cm}^3$
- 2. $3,052.08 \text{ cm}^3$
- 3. 65.94 m^3
- 4. 100.48 cm^3

Extended Practice (Word Problems)

- 1. 200.96 cm^3
- 2. $33,493.33 \text{ cm}^3$
- 3. $31,400 \text{ cm}^3$
- 4. 16 cm
- 5. 15 cm
- 6. 36 cm

Genius Challenge

- 1a. 523.33 cm^3
- c. 87.92 m^3
- b. 261.67 m^3
- d. 131.88 cm^3
- 2. $7,234.56 \text{ cm}^3$
- 3. $4,710 \text{ cm}^3$
- 4. 7.96 cm
- 5. 12 cm

SURFACE AREA (USING FORMULAS)

Extended Practice (Number Problems)

1a. $6a^2 \rightarrow 6 \times 4^2 = 96 \text{ cm}^2$

c. $2(5 \times 4) + 2(4 \times 7) + 2(5 \times 7)$
 $= 2(20 + 28 + 35) = 166 \text{ in}^2$

e. $7 \times 3.3 + 7 \times 4 + 6 \times 4 + 4 \times 4$
 $= 13.2 + 28 + 24 + 16 = 81.2 \text{ cm}^2$

g. $\pi \times 2^2 + \pi \times 2 \times 7$
 $12.56 + 43.96 = 56.5 \text{ mm}^2$

b. $6a^2 \rightarrow 6 \times 6^2 = 216 \text{ cm}^2$

d. $5 \times 3 + 3 \times 2 + 5 \times 2 + 6 \times 2$
 $= 15 + 6 + 10 + 12 = 43 \text{ ft.}^2$

f. $2 \times \pi 5^2 + 2\pi 5 \times 3$
 $2 \times 78.5 + 94.2 = 251.2 \text{ in.}^2$

h. $\pi \times 3^2 + \pi \times 3 \times 8$
 $28.26 + 75.36 = 103.6 \text{ mm}^2$

Extended Practice (Word Problems)

1. $6 \times 7.5^2 = 337.5 \text{ cm}^2$

2. $2(6 \times 5) + 2(5 \times 8) + 2(6 \times 8) = 2(30 + 40 + 48) = 236$

3. $6 \times 5.2 + 6 \times 7 + 6 \times 7 + 6 \times 7 = 157 \text{ in.}^2$

4. Red: $2 \times \pi \times 1^2 + 2\pi \times 1 \times 12$
 $= 6.3 + 75.4 = 81.7 \text{ in.}^2$

Yellow: $2 \times \pi \times 2^2 + 2\pi \times 2 \times 6$
 $25.1 + 75.4 = 100.5 \text{ in.}^2$

The yellow candle has a greater surface area.

5. I do not include the area of the circle because the cone is open.

Chocolate-covered surface = $\pi r s = \pi \times 3 \times 10 = 94.2 \text{ cm}^2$

Genius Challenge

1a. $2(6 \times 5) + 2(5 \times 2) + 2(6 \times 2) = 2(30 + 10 + 12) = 104 \text{ m}^2$

b. $12 \times 5 + 13 \times 4 + 12 \times 4 + 5 \times 4 = 180 \text{ in.}^2$

c. $6 \times 12^2 = 864 \text{ cm}^2$

d. $\pi \times 6^2 + \pi \times 6 \times 7 = 113.04 + 131.88 = 244.92 \text{ in.}^2$

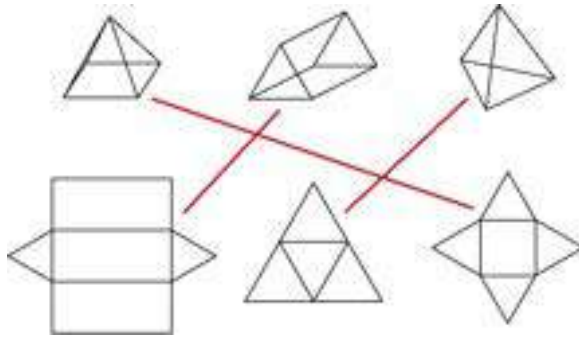
2. $2 \times \pi \times 3^2 + 2\pi \times 3 \times 15 = 56.52 + 282.6 = 339.1 \text{ in}^2$

3. $2(12 \times 10) + 2(10 \times 8) + 2(12 \times 8) - 3 \times 7 = 2(120 + 80 + 96) - 21 = 571 \text{ ft}^2$

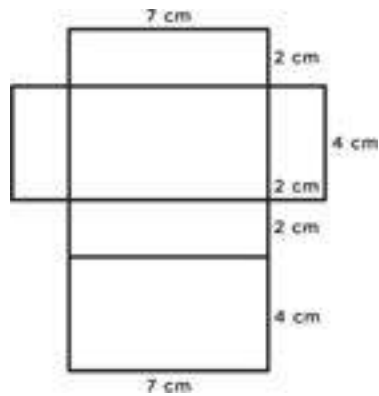
SURFACE AREA USING NETS (PRISMS & PYRAMIDS)

Extended Practice (Number Problems)

1.



2.



$$\text{Area} = 100 \text{ cm}^2$$

3. $(\frac{1}{2} \times 6 \times 10) \times 3 + 15.6 = 105.6 \text{ cm}^2$

Extended Practice (Word Problems)

1a. 2; 5

b. 1; 6

2. $(2 \times 1.5) + (2 \times 1) + (1.5 \times 1) + (2 \times 1) + (1.5 \times 1) = 10 \text{ m}^2$

3. 56 sq. units

4. $\frac{1}{2}(1.5 \times 1.5) + \frac{1}{2}(1.5 \times 1.5) + (2.5 \times 6.05) + (2.5 \times 6.05) + (2.5 \times 1.5) = 36.25 \text{ m}^2$

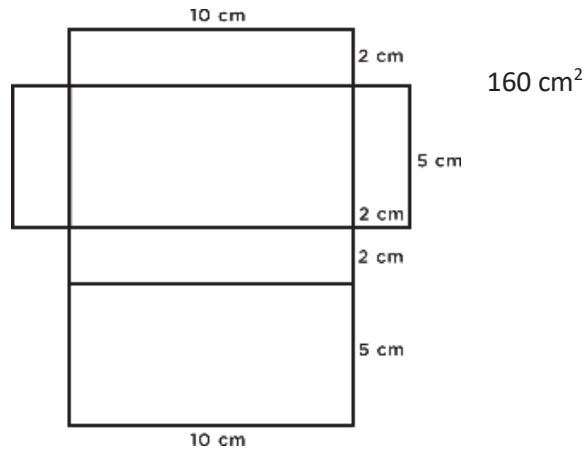
Genius Challenge

1a. 2; 3

b. 1; 4

2. 24 m^2

3.



4. $2 \times \left(\frac{1}{2} \times 30 \times 40\right) + (5 \times 30) + (5 \times 40) + (5 \times 50) = 1,800 \text{ cm}^2$

AREA OF TRIANGLES & QUADRILATERALS (USING FORMULAS)

Extended Practice (Number Problems)

- 1a. 20 in.^2
- c. 32.5 cm^2
- e. 90 in.^2

- b. 48 cm^2
- d. 25.83 cm^2
- f. 60 cm^2

Extended Practice (Word Problems)

- 1. 88 cm^2
- 2. 120 in.^2
- 3. 23.46 yd^2
- 4. 15 m^2

Genius Challenge

- 1a. 15 cm^2
- c. 32.5 in.^2

- b. 66 cm^2
- d. 24 m^2

2. $\frac{1}{2} \times 4 \times 5 = 10 \text{ ft}^2$

$$\frac{1}{2} \times (5 + 8) \times 4 = 26 \text{ ft}^2$$

The total area of the garden is 36 ft^2 .

AREA & CIRCUMFERENCE OF CIRCLES

Extended Practice (Number Problems)

1a. 31.4 cm

b. 40.82 m

2a. 12.56 m²

b. 50.24 cm²

3. 16u cm²

4. 37.68 m

5. 5.5 cm

6. 16 m

Extended Practice (Word Problems)

1. 37.68 m

2. 706.5 cm²

3. 30 cm

4. 16 m

5a. The height is the radius of the circle, r .

b. The base is half the circumference of the circle: ur or $0.5C$.

c. The area of the parallelogram is its base times its height, or $0.5rC$. The area of the parallelogram is equal to the area of a circle. So, the area of a circle is equal to 0.5 times the radius times the circumference.

Genius Challenge

1a. 72.22 cm

b. 43.96 m

2a. 31.4 cm²

b. 6.28 m²

3. 157 cm

4. 254.34 mm²

5. 314 m²

6. 9 m

PERCENTS

Extended Practice (Number Problems)

1a. 29% , $\frac{29}{100}$, 0.29

c. 35% , $\frac{35}{100}$, 0.35

e. 40% , $\frac{40}{100}$, 0.40

2a. 15

c. 20

e. 70

b. 84% , $\frac{84}{100}$, 0.84

d. 60% , $\frac{60}{100}$, 0.60

f. 40% , $\frac{40}{100}$, 0.40

b. 70

d. 60

f. 500

Extended Practice (Word Problems)

1. 4 out of 5 is $\frac{4}{5} = \frac{80}{100} = 80\%$. 8 out of 10 is $\frac{8}{10} = \frac{80}{100} = 80\%$. Both Jenna and Marcus got the same score on their math quiz.

2. 60% of 50 can be calculated with either proportional reasoning or multiplication.

Proportional reasoning

$$\frac{n}{50} = \frac{60}{100} \text{ so } \frac{n \times ?}{50 \times ?} = \frac{60}{100}$$

$50 \times 2 = 100$ and $n \times 2 = 60$. Since
 $30 \times 2 = 60$, 60% of 50 is 30.

Multiplication

$$\begin{aligned} 60\% \times 50 &= n \\ \frac{60}{100} \times 50 &= n \\ \frac{60 \times 50}{100} &= \frac{3000}{100} = \frac{30}{1} = 30 \end{aligned}$$

3a. He forgot to multiply the numerator by 10, the correct answer is 30%.

$$\frac{3}{10} = \frac{3 \times 10}{10 \times 10} = \frac{30}{100}$$

b. He did not convert the fraction into an equivalent fraction with a denominator of 100.

$$\frac{4}{5} = \frac{4 \times 20}{5 \times 20} = \frac{80}{100} = 80\%$$

4. Proportional reasoning and division can both be used to solve.

Proportional reasoning

$$\frac{\text{number of books read}}{\text{number of books on reading list}} = \frac{\text{percent}}{100}$$

$$\text{so, } \frac{14}{n} = \frac{70}{100}$$

$$\frac{14 \times ?}{n \times ?} = \frac{70 \times 100}{100} \text{ Since } 14 \times 5 = 70, n \times 5 = 100. \text{ As}$$

$$20 \times 5 = 100, n = 5.$$

Division

70% of what amount is 14.

$$70\% = \frac{70}{100} = 0.70.$$

$$14 \div 0.70 = 20.$$

There must be 20 books on the reading list.

There must be 20 books on the reading list.

Genius Challenge

1a. 26% , $\frac{26}{100}$, 0.26

b. 87% , $\frac{87}{100}$, 0.87

c. 25% , $\frac{25}{100}$, 0.25

d. 40% , $\frac{40}{100}$, 0.40

e. 50% , $\frac{50}{100}$, 0.50

f. 60% , $\frac{60}{100}$, 0.60

2. The answer can be found using proportional reasoning or multiplication.

Proportional Reasoning

$$26\% \text{ is } \frac{26}{100}. \frac{n}{50} = \frac{26}{100}.$$

$$50 \times 2 = 100, \text{ so } n \times 2 = 26.$$

$$13 \times 2 = 26$$

So, 26% of 50 is 13.

Multiplication

$$26\% = \frac{26}{100}$$

$$26\% \times 50 = ? \frac{26}{100} \times 50 = 13$$

So, 26% of 50 is 13.

3. $20 : 25 = \frac{20}{25} = \frac{20 \times ? = n}{25 \times ? = 100} = \frac{20 \times 4 = n}{25 \times 4 = 100}$, therefore $n = 20 \times 4 = 80$, 80% of Melissa's plants germinated.

4. Proportional reasoning and division can both be used to solve.

Proportional reasoning

$$\frac{\text{number of students at school today}}{\text{number of students enrolled at the school}} = \frac{\text{percent}}{100}$$

$$\frac{120}{n} = \frac{80}{100}$$

$$\frac{120 \times ?}{n \times ?} = \frac{80}{100}$$

Since $120 \times \frac{2}{3} = 80$, multiply n by $\frac{2}{3}$ to get 100.

$$\text{Since } 150 \times \frac{2}{3} = 100$$

There are 150 students enrolled at the school.

Division

80% of what amount is 120?

$$80\% = \frac{80}{100} = 0.80$$

$$120 \div 0.80 = 150$$

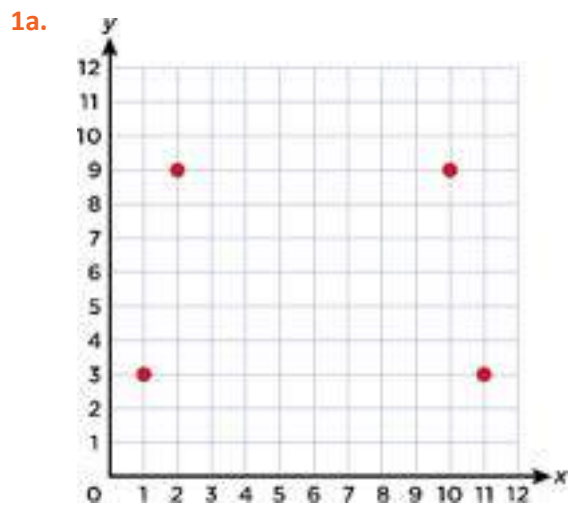
There are 150 students enrolled at the school.

AREA OF POLYGONS (USING DECOMPOSITION)

Extended Practice (Number Problems)

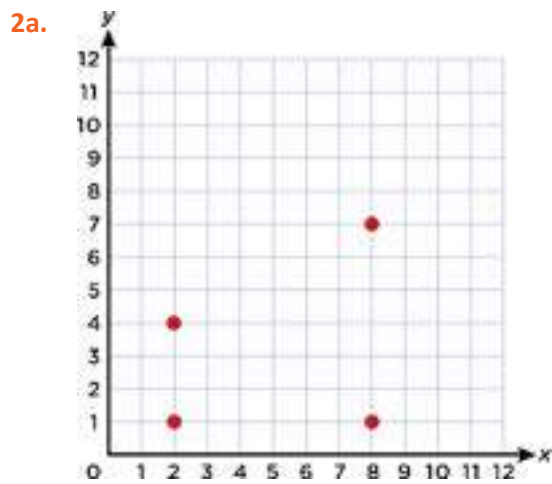
- 1a. 16
- b. 25
- c. 28
- d. 36
- e. 40
- f. 44
- g. 35
- h. 27

Extended Practice (Word Problems)



b. trapezoid

c. 54 ft^2



b. trapezoid

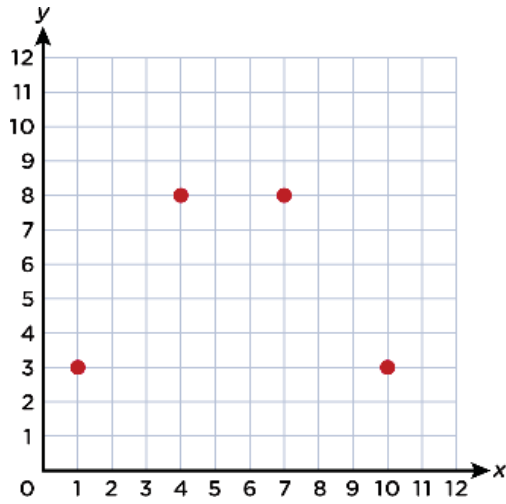
c. 27 m^2

Genius Challenge

- 1a. 17.5
c. 48

- b. 40
d. 70

2a.



b. trapezoid

c. 30 ft^2

SQUARE ROOTS & CUBE ROOTS

Extended Practice (Number Problems)

1a. 8

b. 9

2a. 3

b. 1

3a. 2

b. 11

4a. 4

b. 2

5. 6 cm

6. 13 mm

7. 6 m

8. 7 cm

Extended Practice (Word Problems)

1. 30 meters

2. 10 cm

3. 15 cm

4. 6 cm

5. 7 cm

6. Irrational

7. Rational

Genius Challenge

1a. 7

b. 4

2a. 8

b. 4

3a. 2

b. 10

4. 5 m

5. 40 m

6. 6 cm