Name: _____

Date: _____

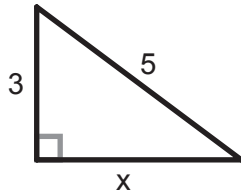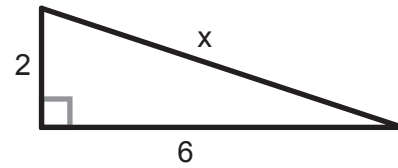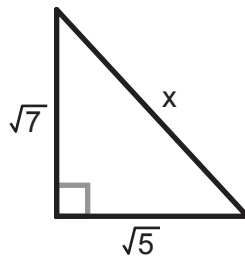# The Pythagorean Theorem

1 Find the length of the unknown side 'x'.

3

5

x

2 Find the length of the unknown side 'x'.

2

x

6

3 Find the length of the unknown side 'x'.

$\sqrt{7}$

x

$\sqrt{5}$

4 Find the length of the unknown side 'x'.

x

x

$3\sqrt{2}$

5 Is this a RIGHT triangle?

5

7

5

6 If the longest side of a triangle is 10 meters, and the other two sides are 6 and 8 meters long, is it a RIGHT triangle?

The Pythagorean Theorem
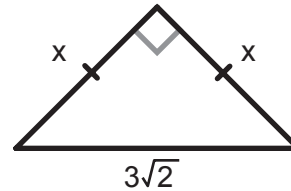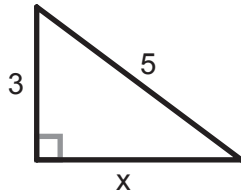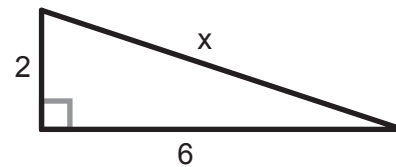
1 Find the length of the unknown side 'x'.

$$3^2 + x^2 = 5^2$$
$$9 + x^2 = 25$$
$$\underline{-9 \qquad\quad -9}$$
$$x^2 = 16$$

$$\sqrt{x^2} = \sqrt{16}$$

$$\boxed{x = 4}$$

2 Find the length of the unknown side 'x'.

$$2^2 + 6^2 = x^2$$
$$4 + 36 = x^2$$
$$40 = x^2$$

$$\sqrt{x^2} = \sqrt{40}$$

$$\boxed{x = \sqrt{40}}$$

or $2\sqrt{10}$

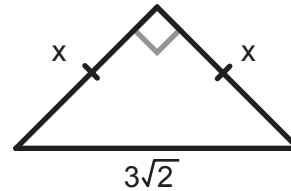or $6.32...$

3 Find the length of the unknown side 'x'.
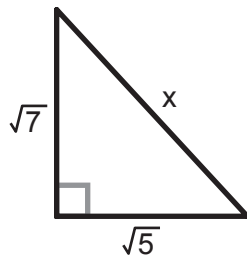
$$\sqrt{7}^2 + \sqrt{5}^2 = x^2$$
$$7 + 5 = x^2$$
$$12 = x^2$$

$$\sqrt{x^2} = \sqrt{12}$$

$$\boxed{x = \sqrt{12}}$$

or $2\sqrt{3}$

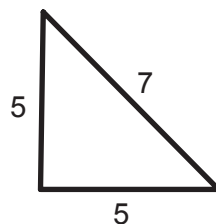or $3.46...$

4 Find the length of the unknown side 'x'.

$$x^2 + x^2 = \left(3\sqrt{2}\right)^2$$
$$2x^2 = (9 \cdot 2)$$
$$\frac{2x^2}{2} = \frac{18}{2}$$

$$x^2 = 9$$

$$\sqrt{x^2} = \sqrt{9}$$

$$\boxed{x = 3}$$

5 Is this a RIGHT triangle?

Check: $5^2 + 5^2 \overset{?}{=} 7^2$

$$25 + 25 \overset{?}{=} 49$$

$$50 \neq 49 \qquad \boxed{No}$$

6 If the longest side of a triangle is 10 meters, and the other two sides are 6 and 8 meters long, is it a RIGHT triangle?

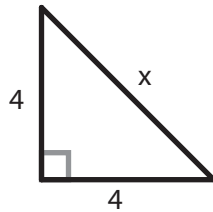Check: $6^2 + 8^2 \overset{?}{=} 10^2$

$$36 + 64 \overset{?}{=} 100$$

$$100 = 100 \quad \boxed{Yes}$$

Finding an Unknown Side - Set 1

Instructions: For each right triangle, use the Pythagorean Theorem to find the length of the unknown side 'x'. (You can use a calcuator for the arithmetic if you want to.)
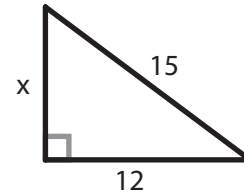
1

4   x   4

$4^2 + 4^2 = x^2$

$16 + 16 = x^2$
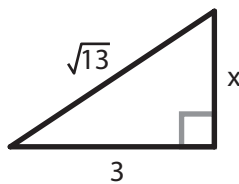
$32 = x^2$

$\sqrt{x^2} = \sqrt{32}$

$x = \sqrt{32}$
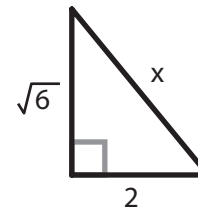
or $4\sqrt{2}$

or $5.656...$

2

15   x   12

3

$\sqrt{13}$ x   3

4

x $\sqrt{6}$ 2

5

4   x   3

6

2.5   1.5   x

Name: _____

Date: _____

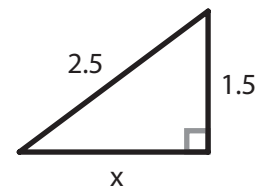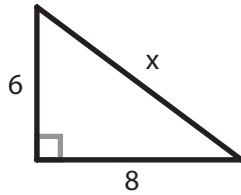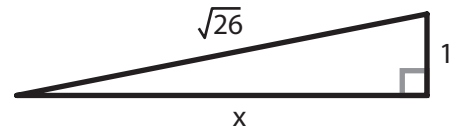## Finding an Unknown Side - Set 2

Instructions: For each right triangle, use the Pythagorean Theorem to find the length of the unknown side 'x'. (You can use a calcuator for the arithmetic if you want to.)
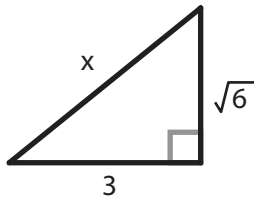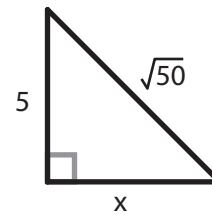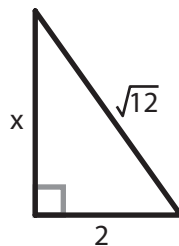
1

6

x

8

2

$\sqrt{26}$

1

x

3

x

$\sqrt{6}$

3

4

5

$\sqrt{50}$

x

5

$\sqrt{12}$

x

2

6

x

0.3

0.4

Is it a *right* triangle?

Instructions: Use the Pythagorean Theorem to test the triangles shown or described in each problem below.

1 If a triangle has sides that are 12, 10 and 6 meters long, is it a right triangle?

NOTE: when plugging the three sides into the test equation, always make the longest side 'c'.

Test: $6^2 + 10^2 \overset{?}{=} 12^2$

$36 + 100 \overset{?}{=} 144$

$136 \neq 144$ (Nope!)

2 Is this a right triangle?

$\sqrt{32}$ / 4 / 4

3 Is a triangle with side lengths of 4, 5, and 6 inches a right triangle?

4 A triangle has side lengths that are 7 cm, 7 cm and 11cm. Is it a right triangle ?

5 Is this a right triangle?

$\sqrt{41}$ / 5 / 4

6 Is this a right triangle?

$\sqrt{5}$ / 3 / $\sqrt{13}$

Name: _____

Date: _____

Finding an Unknown Side - Set 1

Instructions: For each right triangle, use the Pythagorean Theorem to find the length of the unknown side 'x'. (You can use a calcuator for the arithmetic if you want to.)
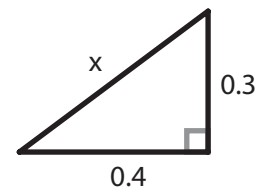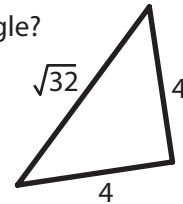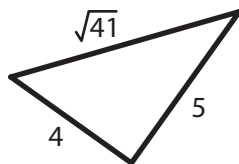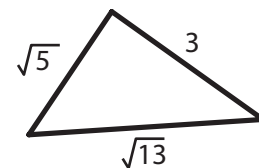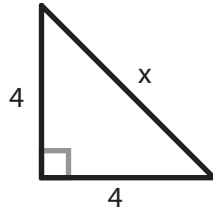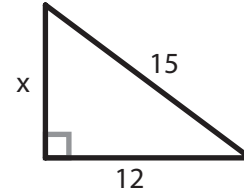
1

$4^2 + 4^2 = x^2$

$16 + 16 = x^2$

$32 = x^2$

$\sqrt{x^2} = \sqrt{32}$

$x = \sqrt{32}$

or $4\sqrt{2}$

or $5.656...$

2

$x^2 + 12^2 = 15^2$

$x^2 + 144 = 225$
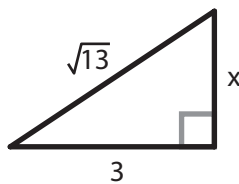
$-144 \quad -144$

$x^2 = 81$

$\sqrt{x^2} = \sqrt{81}$

$x = 9$

3

$x^2 + 3^2 = \sqrt{13}^2$

$x^2 + 9 = 13$

$-9 \quad -9$

$x^2 = 4$

$\sqrt{x^2} = \sqrt{4}$

$x = 2$

4
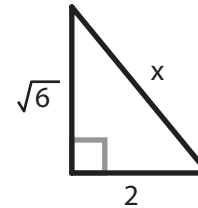
$\sqrt{6}^2 + 2^2 = x^2$

$6 + 4 = x^2$

$10 = x^2$

$\sqrt{x^2} = \sqrt{10}$

$x = \sqrt{10}$
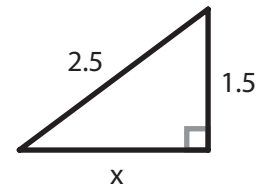
or $3.162...$

5

$x^2 + 3^2 = 4^2$

$x^2 + 9 = 16$

$-9 \quad -9$

$x^2 = 7$

$\sqrt{x^2} = \sqrt{7}$

$x = \sqrt{7}$

or $2.645...$

6

$x^2 + 1.5^2 = 2.5^2$

$x^2 + 2.25 = 6.25$

$-2.25 \quad -2.25$

$x^2 = 4$

$\sqrt{x^2} = \sqrt{4}$

$x = 2$

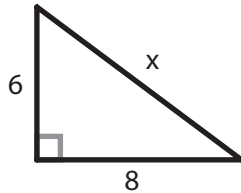▶ The Pythagorean Theorem • mathantics.com

Math Antics
Worksheets

Finding an Unknown Side - Set 2

Instructions: For each right triangle, use the Pythagorean Theorem to find the length of the unknown side 'x'. (You can use a calcuator for the arithmetic if you want to.)
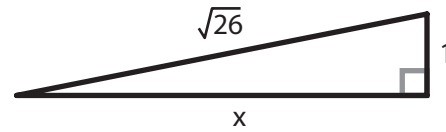
1

$6^2 + 8^2 = x^2$

$36 + 64 = x^2$

$100 = x^2$

$\sqrt{x^2} = \sqrt{100}$

$x = 10$

2

$x^2 + 1^2 = \sqrt{26}^2$

$x^2 + 1 = 26$

$ -1 \quad -1$

$x^2 = 25$

$\sqrt{x^2} = \sqrt{25}$

$x = 5$

3

$\sqrt{6}^2 + 3^2 = x^2$

$6 + 9 = x^2$

$15 = x^2$

$\sqrt{x^2} = \sqrt{15}$

$x = \sqrt{15}$

or $3.872...$

4
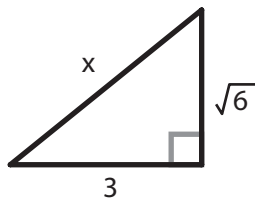
$5^2 + x^2 = \sqrt{50}^2$

$25 + x^2 = 50$

$-25 -25$

$x^2 = 25$

$\sqrt{x^2} = \sqrt{25}$

$x = 5$

5
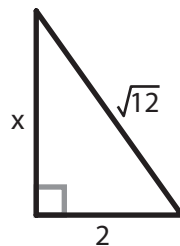
$x^2 + 2^2 = \sqrt{12}^2$

$x^2 + 4 = 12$

$ -4 \quad -4$

$x^2 = 8$

$\sqrt{x^2} = \sqrt{8}$

$x = \sqrt{8}$

or $2\sqrt{2}$

or $2.828...$

6
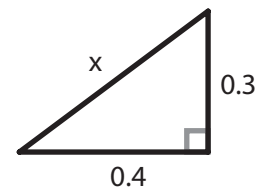
$0.3^2 + 0.4^2 = x^2$

$0.09 + 0.16 = x^2$

$0.25 = x^2$

$\sqrt{x^2} = \sqrt{0.25}$

$x = 0.5$

or $\sqrt{0.25}$

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Math Antics Worksheets

Name: _____

Date: _____
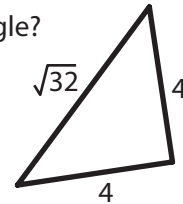
Is it a *right* triangle?

Instructions: Use the Pythagorean Theorem to test the triangles shown or described in each problem below.

1 If a triangle has sides that are 12, 10 and 6 meters long, is it a right triangle?

NOTE: when plugging the three sides into the test equation, always make the longest side 'c'.

Test: $6^2 + 10^2 \overset{?}{=} 12^2$

$36 + 100 \overset{?}{=} 144$

$136 \neq 144$ (Nope!)

2 Is this a right triangle?

Test:

$4^2 + 4^2 \overset{?}{=} \sqrt{32}^2$

$16 + 16 \overset{?}{=} 32$

$32 = 32$ (Yes)

3 Is a triangle with side lengths of 4, 5, and 6 inches a right triangle?

Test: $4^2 + 5^2 \overset{?}{=} 6^2$

$16 + 25 \overset{?}{=} 36$

$41 \neq 36$ (No)

4 A triangle has side lengths that are 7 cm, 7 cm and 11cm. Is it a right triangle ?

Test: $7^2 + 7^2 \overset{?}{=} 11^2$

$49 + 49 \overset{?}{=} 121$

$98 \neq 121$ (No)
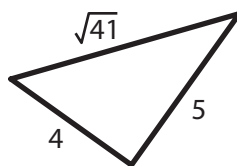
5 Is this a right triangle?

Test:

$4^2 + 5^2 \overset{?}{=} \sqrt{41}^2$

$16 + 25 \overset{?}{=} 41$

$41 = 41$ (Yes)

6 Is this a right triangle?
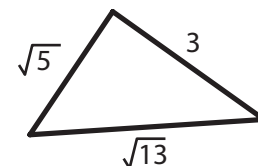
Test:

$3^2 + \sqrt{5}^2 \overset{?}{=} \sqrt{13}^2$

$9 + 5 \overset{?}{=} 13$

$14 \neq 13$ (No)

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