

Unit 8: Pythagorean Theorem and Irrational Numbers

Name: _____

Lesson 1: The Areas of Squares and Their Side Lengths

If you have a square whose side length you know, how can you find the area?

If you have a square whose area you know, how can you find the side length?

Lesson 2: Side Lengths and Areas

What does it mean when we write $\sqrt{144} = 12$ in terms of a square and its side length?

What is a square root?

Lesson 3: Rational and Irrational Numbers

What is a rational number? Give two examples.

What is an irrational number? Give two examples.

Lesson 4: Square Roots on the Number Line

How can you approximate the value of $\sqrt{90}$? What two integers is it between?

How could we get more specific than that?

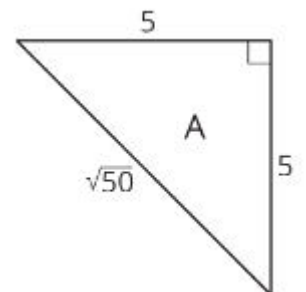
Lesson 5: Reasoning About Square Roots

Which of the following fall between 4 and 6? Explain how you know. $\sqrt{17}$ $\sqrt{5}$ $\sqrt{38}$

Lesson 6: Finding Side Lengths of Triangles

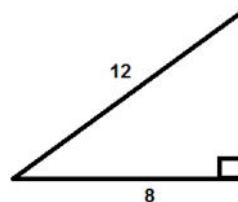
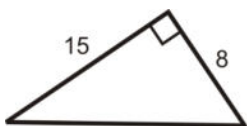
The Pythagorean Theorem says the _____ of the _____ of the _____ is equal to the _____ of the _____.

Label the legs and hypotenuse of the triangle.



Lesson 8: Finding Unknown Side Lengths

Find the missing sides of the triangles.



A triangle has sides 8, 11, and x . Find x if it is the hypotenuse. Then find x if it is one of the legs.

Lesson 9: The Converse

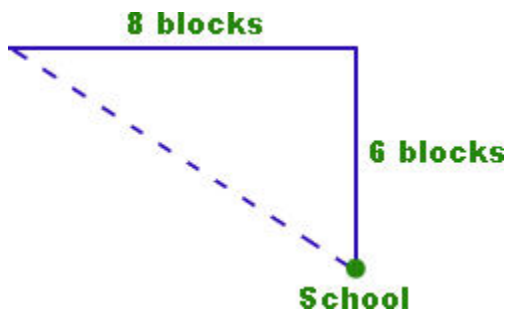
How can you be sure that a triangle is a right triangle?

A triangle has sides 8, 9, and $\sqrt{17}$. Is it a right triangle?

A triangle has sides 12, 5, and 4. Is it a right triangle?

Lesson 10: Applications of the Pythagorean Theorem

What are the characteristics of a real-world situation in which the Pythagorean Theorem applies?



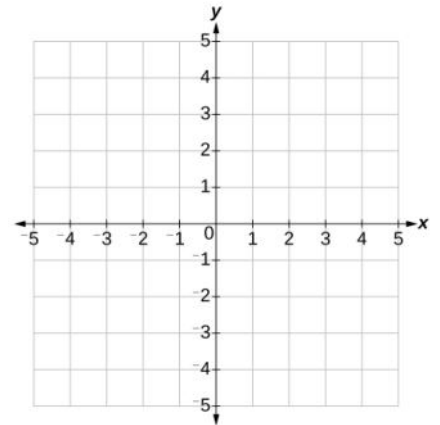
A new fence means Claire cannot cut across the field to get to school since she now has to walk 8 blocks east, turn south and walk 6 more blocks on the sidewalk. How much **further** does she have to walk to school now than when she could take her shortcut?

Lesson 11: Finding Distances in the Coordinate Plane

How can you find the distance between two points in the coordinate plane?

- If they are horizontal or vertical to each other:
- If they are diagonal from each other:

Find the distance between $(-2, 3)$ and $(4, -1)$.



Lesson 12: Edge Lengths and Volume

How do we find the volume of a cube if we know its side length?

How do we find the side length of a cube if we know its volume?

What is the side length of a cube with volume 125 cubic units?

What integers does $\sqrt[3]{100}$ fall between?

Lesson 13: Cube Roots

Find the solution to each of the following equations.

$$x^3 = 27$$

$$x^3 = -27$$

$$x^3 = 25$$

Do $\sqrt{49}$ and $\sqrt[3]{49}$ fall in the same place on a number line? Why or why not?

Lesson 14: Decimal Representations of Rational Numbers

What do we know about the decimal expansion of rational numbers?

Explain how you know that -2.6 is a rational number.

Lesson 15: Infinite Decimal Expansions

Let $x = 0.253$ and $y = 0.\underline{253}$.

Is x a rational number? Why or why not?

Is y a rational number? Why or why not?

Which one of x and y is larger?