

Geometry Lesson 8

Objective: TSW calculate values using formulas.

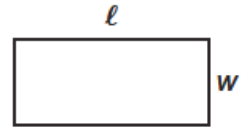
Date: _____

Period: _____

_____ - A mathematical relationship expressed with symbols. Some formulas have already been encountered in algebra.

Perimeter - The sum of the side lengths of a closed geometric figure. It is often thought of as the distance around a figure.

There is a special formula to find the perimeter of a rectangle, where P is the perimeter, l is the length of the rectangular base, and w is the width, or height, of the rectangle.



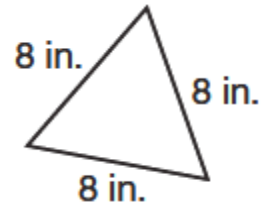
Math Reasoning

Write List some other formulas used in other math classes, such as in algebra. How might these formulas be helpful in geometry?

Example 1. Finding Perimeter of a Figure.

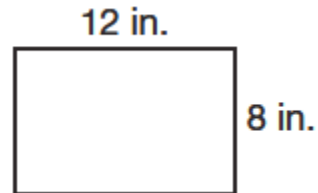
- a. Find the perimeter of the triangle.

SOLUTION



- b. Find the perimeter of the rectangle.

SOLUTION



- c. If a regular pentagon has a side length of 8 inches, what is its perimeter?

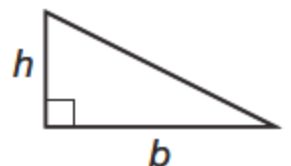
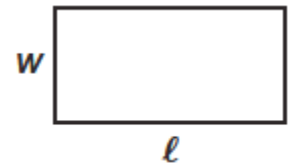
SOLUTION

_____ - The size of the region bounded by the figure.

The area of a rectangle is found by the following formula, where l is the length of the figure's base and w is the length of the figure's height: $A = lw$

The area of a triangle is found by the following formula: $A = \frac{1}{2}bh$

The area of a figure is always expressed in _____ units.



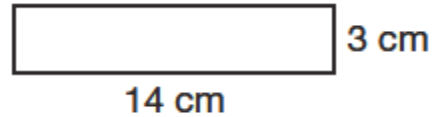
Math Reasoning

Formulate Draw a diagonal from one corner of a rectangle to the other. What shapes does the diagonal create? Explain how this relates to the formula for area of a triangle.

Example 2 Using the Area Formula for a Rectangle

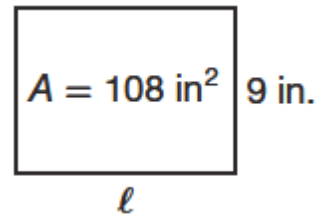
- a. Find the area of the rectangle.

SOLUTION

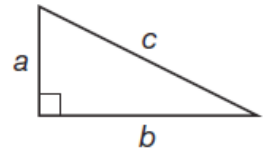


- b. Find the length of the rectangle.

SOLUTION



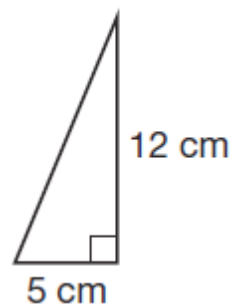
Theorem 8-1: Pythagorean Theorem - The sum of the square of the lengths of the legs, a and b , of a right triangle is equal to the square of the length of the hypotenuse c and is written $a^2 + b^2 = c^2$.



Example 3. Using the Pythagorean Theorem.

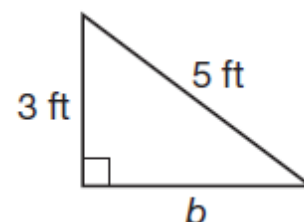
- a. Find the length of the hypotenuse.

SOLUTION



- b. Find the area of the triangle.

SOLUTION



Caution

The Pythagorean Theorem only applies to right triangles.

A right angle is denoted with a small square in the corner that has a measure of 90° .

Then calculate the area of the triangle.

Example 4 Application: Measuring Temperature

Different countries use different units to measure the temperature. Much of the world uses degrees Celsius, but a few countries use degrees Fahrenheit. For scientists and travelers, converting between Celsius and Fahrenheit is an important skill.

To convert to Celsius from Fahrenheit, use the formula: $C = \frac{5}{9}(F - 32)$

a. If it is 77°F , what is the temperature in degrees Celsius?

SOLUTION

b. If it is 10°C , what is the temperature in degrees Fahrenheit?

SOLUTION

You Try!!!!

g. Use the Pythagorean Theorem to find the area of a triangle with a hypotenuse of 17 millimeters and a side length of 15 millimeters.

60mm^2

i. If it is 100° Celsius, what is the temperature in degrees Fahrenheit?

112°F