Lesson 12

NAME:

Solving Problems with Formulas

Start by navigating to the Online Lesson for instructions.

Objectives

- Determine the correct formula to solve
- Apply the following formulas for area: triangle, square, rectangle, trapezoid, and circle
- Apply the following formulas for perimeter: triangle, square, rectangle, trapezoid, and circle
- Apply the following formulas for volume: prism, cone, pyramid, sphere, and cylinder
- Label a solution with the correct units

Why?

We use formulas to find the area, perimeter, and volume of shapes so we can understand how much space or distance something takes up. Knowing which formula to use helps us solve real-world problems such as buying paint or flooring, filling a pool, or designing a room. Formulas make math a powerful tool for solving everyday measurement problems.

Explore

Solving Problems with Formulas

Fill in the notes as you watch the video in the Online Lesson.

- When solving problems with formulas, start by _____ the problem carefully.
    - Name the _____ that contains both the value that you are solving for and the values that you already know.
- Once you have written down a formula and defined the _____ in the problem:
    - _____ the values that you already know into the formula.
    - _____ for the remaining variable in the formula.
- Remember to label your final answer with the correct _____. If no units of measurement are specified, simply use “units.”

Example 1

Complete the example as you watch the video in the Online Lesson.

Determine the formula needed to solve.

Triangle: $P = a + b + c$ **Rectangle:** $P = 2l + 2w$

The perimeter of a rectangle is 48 units. The length is twice the width plus 3. What are the dimensions?

Implement

$P = 2l + 2w$

$P = 48$

$l = 2w + 3$

$48 = 2(2w + 3) + 2w$

Explain

- Name the formula
  Identify the key information
  Determine the equation for length
  using mathematical vocabulary
- Substitute values into the formula
- Solve for the variable, w
- Substitute to find the length, l

The dimensions of the rectangle are

Example 2

Complete the example as you watch the video in the Online Lesson.

Determine the formula needed to solve.

Triangle: $P = a + b + c$ **Rectangle:** $P = 2l + 2w$

The perimeter of a triangle is 30 inches. Side b is twice the length of side a, and side c is three times the length of side a. Find the dimensions of the triangle.

Implement

Explain

- Name the formula
  Identify the key information
  Determine the equations for b and c

- Solve for a, b, and c

Practice

Determine the formula needed to solve. Show your work.

Rectangle	Triangle	Rectangular Prism	Rectangular Pyramid
$A = lw$ or $A = bh$ $P = 2(l + w)$ or $P = 2l + 2w$	$A = \frac{1}{2}bh$ or $A = \frac{bh}{2}$ $P = a + b + c$	$V = lwh$	$V = \frac{1}{3}lwh$

1) The perimeter of a rectangle is 36 inches. The length is two more than the width. Find the dimensions of the rectangle.

2) The perimeter of a triangle is 19 cm. The largest side is twice the smallest side plus one. The middle side is two more than the smallest side. Find the dimensions of the triangle.

Rectangle	Triangle	Rectangular Prism	Rectangular Pyramid
$A = lw$ or $A = bh$ $P = 2(l + w)$ or $P = 2l + 2w$	$A = \frac{1}{2}bh$ or $A = \frac{bh}{2}$ $P = a + b + c$	$V = lwh$	$V = \frac{1}{3}lwh$

Determine the formula needed to solve. Show your work.

3) Find the height of a pyramid if the volume is $35\ \text{cm}^3$, the length of the base is 3 cm, and the width of the base is 5 cm.

4) Find the length of a rectangular prism if the height is 12 inches, the width is 4 inches, and the volume is 72 cubic inches.

To continue, return to the Online Lesson.