

Shape Equation Quest

Write and solve equations for area and volume.

GRADE 6 • TEKS 6.8.C

6.8.C "write equations that represent problems related to the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers; and"

NAME _____

DATE _____

CHOOSE THE RIGHT FORMULA

Use $A = l \cdot w$ for a rectangle, $A = b \cdot h$ for a parallelogram, $A = \frac{1}{2} \cdot b \cdot h$ for a triangle, and $A = \frac{1}{2} \cdot (b_1 + b_2) \cdot h$ for a trapezoid. Use $V = l \cdot w \cdot h$ for a right rectangular prism, and let x represent whichever quantity is unknown.

WORKED EXAMPLE

A rectangle is $\frac{11}{6}$ ft long and $\frac{5}{8}$ ft wide. Find its area.

1. Use the rectangle rule: $A = l \cdot w$.
2. $A = (\frac{11}{6}) \cdot (\frac{5}{8})$.
3. $A = \frac{55}{48}$.

Answer: $\frac{55}{48}$ square feet

PRACTICE 6 problems

- 1** A rectangle has a length of $\frac{3}{4}$ m and a width of $\frac{10}{9}$ m. Let x be its area. Write and solve an equation.

ANSWER _____

- 2** A parallelogram has a base of $\frac{7}{5}$ cm and a height of $\frac{15}{7}$ cm. Let x be its area. Write and solve an equation.

ANSWER _____

- 3** A triangle has an area of $\frac{9}{10}$ square inch and a height of $\frac{3}{5}$ inch. Let x be its base. Write and solve an equation.

ANSWER _____

- 4** A trapezoid has bases of $\frac{2}{3}$ yd and $\frac{5}{6}$ yd. Its height is $\frac{4}{5}$ yd. Let x be its area. Write and solve an equation.

ANSWER _____

- 5** A right rectangular prism has a length of $\frac{7}{4}$ in., a width of $\frac{4}{7}$ in., and a height of $\frac{9}{10}$ in. Let x be its volume. Write and solve an equation.

ANSWER _____

- 6** A right rectangular prism has a volume of $\frac{7}{6}$ cubic foot. Its length is $\frac{5}{3}$ ft and its width is $\frac{7}{10}$ ft. Let x be its height. Write and solve an equation.

ANSWER _____

APPLY IT Show your work

- 1** The gaming club is making a rectangular poster that is $2\frac{1}{2}$ ft wide and $1\frac{1}{5}$ ft tall. Let x be the area of the poster. Write and solve an equation for x .

WORK SPACE

ANSWER _____

- 2** A student is designing a clear rectangular display case for trading cards. The case will be $\frac{3}{4}$ ft long, $\frac{2}{3}$ ft wide, and $\frac{5}{2}$ ft high. Let x be its volume. Write and solve an equation for x .

WORK SPACE

ANSWER _____

CHALLENGE One step up

A trapezoid has an area of $\frac{25}{18}$ square meters. Its bases are $\frac{2}{3}$ m and $\frac{1}{6}$ m. Let x be its height. Write and solve an equation for x .

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A rectangle has a length of $\frac{3}{4}$ m and a width of $\frac{10}{9}$ m. Let x be its area. Write and solve an equation.	$x = (\frac{3}{4}) * (\frac{10}{9}) = \frac{5}{6}$ square meter
2	A parallelogram has a base of $\frac{7}{5}$ cm and a height of $\frac{15}{7}$ cm. Let x be its area. Write and solve an equation.	$x = (\frac{7}{5}) * (\frac{15}{7}) = 3$ square centimeters
3	A triangle has an area of $\frac{9}{10}$ square inch and a height of $\frac{3}{5}$ inch. Let x be its base. Write and solve an equation.	$\frac{9}{10} = \frac{1}{2} * x * (\frac{3}{5}); x = 3$ inches
4	A trapezoid has bases of $\frac{2}{3}$ yd and $\frac{5}{6}$ yd. Its height is $\frac{4}{5}$ yd. Let x be its area. Write and solve an equation.	$x = \frac{1}{2} * (\frac{2}{3} + \frac{5}{6}) * (\frac{4}{5}) = \frac{3}{5}$ square yard
5	A right rectangular prism has a length of $\frac{7}{4}$ in., a width of $\frac{4}{7}$ in., and a height of $\frac{9}{10}$ in. Let x be its volume. Write and solve an equation.	$x = (\frac{7}{4}) * (\frac{4}{7}) * (\frac{9}{10}) = \frac{9}{10}$ cubic inch
6	A right rectangular prism has a volume of $\frac{7}{6}$ cubic foot. Its length is $\frac{5}{3}$ ft and its width is $\frac{7}{10}$ ft. Let x be its height. Write and solve an equation.	$\frac{7}{6} = (\frac{5}{3}) * (\frac{7}{10}) * x; x = 1$ foot

PART 2 • APPLY IT

1. $x = (\frac{5}{2}) * (\frac{6}{5}) = 3$ square feet Change the mixed numbers to $\frac{5}{2}$ and $\frac{6}{5}$. Multiply the length and width to find the area.
2. $x = (\frac{3}{4}) * (\frac{2}{3}) * (\frac{5}{2}) = \frac{5}{4}$ cubic feet Multiply the length, width, and height. The product is the volume of the right rectangular prism.

CHALLENGE

$$25/18 = \frac{1}{2} * (\frac{2}{3} + \frac{1}{6}) * x; x = 10/3 \text{ meters}$$

Accept equivalent equations with factors written in a different order. Accept equivalent fraction answers and appropriate square or cubic units.