

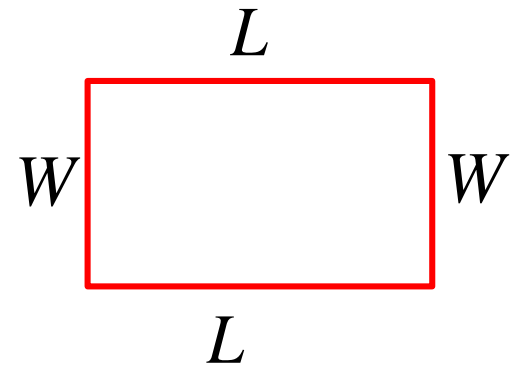
Math-2
Lesson 1-3
Applications of Simple Equations

Quantity: A category of measurement of a real world physical property (length, width, temperature, pressure, weight, etc.).

Unit of Measure: An agreed upon standard used to measure the size or magnitude of a quantity. (Example: units of length are; inches, meters, miles, etc.).

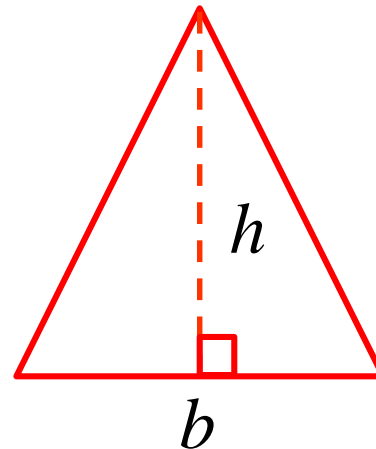
Formula: An equation that relates two or more quantities, represented by variables.

$$Area_{\text{rectangle}} = l * w$$



$$Perimeter_{\text{rectangle}} = 2L + 2w$$

$$Area_{\text{triangle}} = \frac{1}{2}bh$$



Solving formula Problems

1. Draw and label a picture with the measurements that are given in the problem. (it helps to see it)
2. Write the formula
3. Substitute measurements given in the problem for the variables in the formula.
4. Solve for the variable.

Your turn: for the area of a triangle formula: $A = \frac{1}{2}bh$

1) Solve for “b”

2) Solve for “h”.

Solving formula Problems

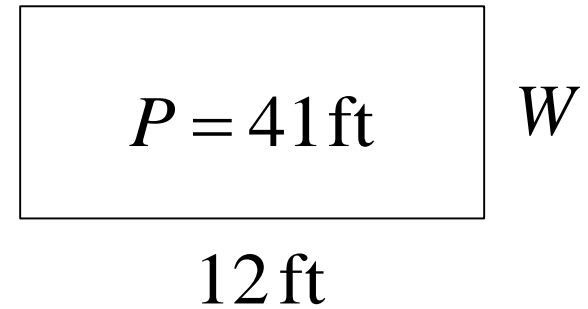
The perimeter of a rectangular back yard is 41 feet. Its length is 12 feet. What is its width?

Write the formula

$$\text{Perimeter}_{\text{rectangle}} = ?$$

$$P_{\text{rectangle}} = 2L + 2w$$

Draw and label the picture



Replace variables in the formula with values given in the problem.

$$41 \text{ ft} = 2(12 \text{ ft}) + 2w$$

$$\begin{array}{r|l} 41 = & 24 + 2w \\ -24 & -24 \\ \hline 17 = & 2w \end{array}$$

Solve for the variable

$$17 = 2w$$

$$\div 2 \quad \div 2$$

$$\frac{17}{2} \text{ ft} = w = 8.5 \text{ ft}$$

The perimeter of a rectangular back yard is 200 meters. Its length is 25 meters. What is its width?

Write the formula

$$P_{\text{rectangle}} = 2L + 2w$$

Replace known variables in the formula with constants

$$\underline{200} = 2(\underline{25\text{ m}}) + 2(\underline{w})$$

Solve for the variable

$$200 = 50 + 2w$$

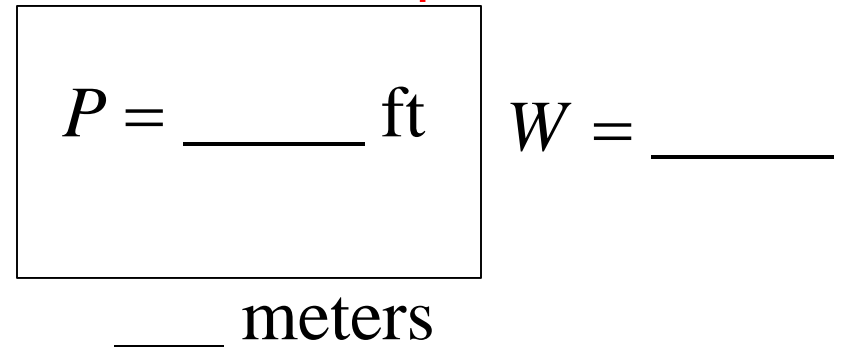
$$\underline{-50} \quad \underline{-50}$$

$$150 = 2w$$

$$\underline{\div 2} \quad \underline{\div 2}$$

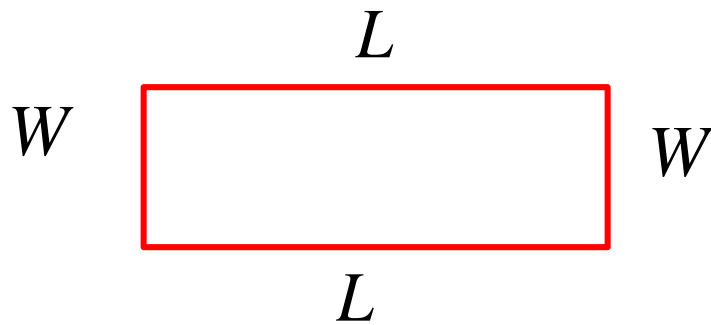
$$75\text{ m} = w$$

Draw the picture



$$P_{\text{rectangle}} = 2L + 2W$$

$$\text{Area}_{\text{rectangle}} = l * w$$



The width of a rectangle is 2 feet. The length is twice the width. What is the perimeter of the rectangle?

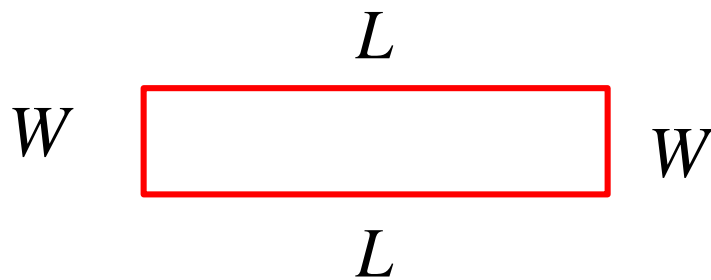
$$\underline{P} = 2(\underline{2 * 2 \text{ ft}}) + 2(\underline{2 \text{ ft}}) \quad P = 12 \text{ ft}$$

$$P = 8 \text{ ft} + 4 \text{ ft}$$

The width of a rectangle is 3 feet. The length is four times the width. What is the area of the rectangle?

$$\underline{A} = (\underline{4 * 3 \text{ ft}}) * (\underline{3 \text{ ft}})$$

$$A = (12 \text{ ft})(3 \text{ ft}) \quad A = 36 \text{ ft}^2$$



A fence around a horse corral has a total of 680 feet of fence in a rectangular shape. If the width is 90 feet, what is the length?

$$\underline{680} = 2(\underline{\quad L \quad}) + 2(\underline{90 \text{ ft}})$$

$$680 = 2L + 180 \text{ ft}$$

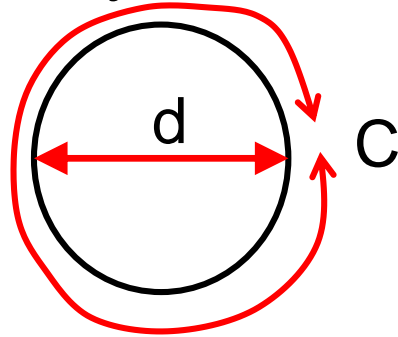
$$250 \text{ ft} = L$$

The area of a rectangle is 450 square feet. If the width is 75 feet, what is the length?

$$\underline{450 \text{ ft}^2} = (\underline{\quad L \quad}) * (\underline{75 \text{ ft}})$$

$$L = 6 \text{ ft}$$

Pi (π): An “irrational number defined by the ratio of a circles circumference divided by it’s diameter.



$$\pi = \frac{C}{d}$$

Is the following equation equivalent to the definition of *pi* ?

$$\begin{array}{l|l} C = 2\pi r & \text{Solve for radius} \\ \div 2\pi & \div 2\pi \\ \hline \frac{C}{2\pi} = r & r = \frac{C}{2\pi} \end{array}$$

The circumference of a circle is 36π meters. What is the radius of the circle?

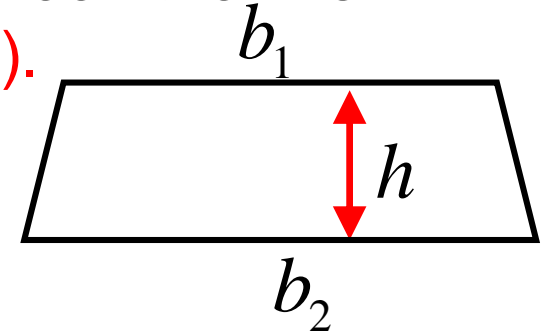
The diameter of a circle is 20 feet. What is the circumference of the circle?

$$A = \frac{1}{2}(b_1 + b_2)h$$

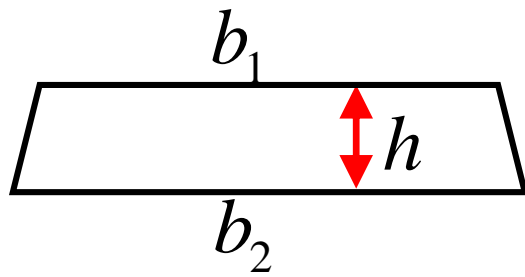
Solve for 'h'.

Solve for b_2

(Area of a trapezoid: where the length of the parallel bases are $(b_1 \text{ and } b_2)$ and the distance between them is called the "height" ('h').



$$A = \frac{1}{2}(b_1 + b_2)h$$



The area of a trapezoid is 50 square meters. If the height of the trapezoid is 7 meters, and one base is 3 meters, what is the length of the other base?

One base has a length of 6 feet. The other base is three times as long. If the area of the trapezoid is 75 square feet, what is the height?

If the base of a triangle is 4 inches and its area is 15 square inches, what is its height?

The area of a trapezoid is 40 square feet. The length of one base is 8 feet and its height is 3 feet, what is the length of the other base?

The perimeter of a rectangle is 100 miles. It is 22 miles long. How wide is the rectangle?

Distance = speed * time

Distance = “rate” * time

$$D = r * t$$

If you drove 275 miles in 6 hours, what was your speed?

If you drive 5 hours at 80 miles per hour, how far did you go?

If your speed was 35 miles per hour, how long did it take to travel 137 miles?

Distance—speed—time problems

If you drive 4 hours at 60 miles per hour, how far did you go?

If you drove 150 miles in 3 hours, what was your speed?

If your speed was 70 miles per hour, how long did it take to travel 200 miles?