

I can write and solve an equation from a real-world situation

Manipulating Algebraic Equations

A literal equation is an equation involving two or more variables. Formulas are special types of literal equations. To transform a literal equation, you solve for one variable in terms of the others.

1. Express the height h of a triangle in terms of the area A and the b .

$$A = \frac{1}{2}bh$$

2. Express the radius r of a cylinder in terms of the volume V and the height h .

$$V = \pi r^2 h$$

3. The formula $C = \frac{5}{9}(F - 32)$ gives the Celsius temperature in terms of the Fahrenheit temperature. Transform the formula to find F in terms of C .

4. You can use the number of chirps a cricket makes in one minute to estimate the outside temperature in degrees Fahrenheit.

Transform the formula $F = \frac{n}{4} + 37$ to find the number of chirps a cricket makes in a minute in terms of a given temperature.

Try A Few!

Solve each of the following literal equations for the given variable:

Solve for t :

$$A = P(1 + rt)$$

Solve for x :

$$ax + b = cx - d$$

Solve for v :

$$K = \frac{1}{2}mv^2$$

Solve for x :

$$\frac{ax}{b} + \frac{cx}{d} = 3$$

Solve for b :

$$p = t\sqrt{r} - y$$

Solve for g :

$$\frac{1}{2}g + 9 = f$$

Solve for x :

$$7x + 2a = 3x + 5a$$

Solve for r :

$$V = \frac{4}{3}\pi r^3$$

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A literal equation is an equation involving two or more variables. Formulas are special types of literal equations. To transform a literal equation, you solve for one variable in terms of the others.

1. Express the height h of a triangle in terms of the area A and the b .

$$2 \cdot A = \frac{1}{2}bh \cdot 2$$

$$\frac{2A}{b} = \frac{b \cdot h}{b}$$

$$\boxed{\frac{2A}{b} = h}$$

2. Express the radius r of a cylinder in terms of the volume V and the height h .

$$\frac{V}{\pi h} = \frac{\pi r^2 h}{\pi h}$$

$$\sqrt{\frac{V}{\pi h}} = \sqrt{r^2}$$

$$\boxed{\sqrt{\frac{V}{\pi h}} = r}$$

3. The formula $C = \frac{5}{9}(F - 32)$ gives the Celsius temperature in terms of the Fahrenheit temperature. Transform the formula to find F in terms of C .

$$\frac{9}{5} \cdot C = \frac{5}{9}(F - 32) \cdot \frac{9}{5}$$

$$\frac{9}{5}C = F - 32$$

+32 +32

$$\boxed{\frac{9}{5}C + 32 = F}$$

4. You can use the number of chirps a cricket makes in one minute to estimate the outside temperature in degrees Fahrenheit.

Transform the formula $F = \frac{n}{4} + 37$ to find the number of chirps a cricket makes in a minute in terms of a given temperature.

$$F = \frac{n}{4} + 37$$

-37 -37

$$4 \cdot (F - 37) = \frac{n}{4} \cdot 4$$

$$\boxed{4(F - 37) = n}$$

Try A Few!

Solve each of the following literal equations for the given variable:

Solve for t :

$$A = P(1 + rt)$$

$$\frac{A - P}{Pr} = t$$

Solve for x :

$$ax + b = cx - d$$

$$\frac{b + d}{c - a} = x$$

Solve for v :

$$K = \frac{1}{2}mv^2$$

$$\sqrt{\frac{2K}{m}} = v$$

Solve for x :

$$\frac{ax}{b} + \frac{cx}{d} = 3$$

$$x = \frac{3db}{da + bc}$$

Solve for r :

$$p = t\sqrt{r} - y$$

$$\left(\frac{p + y}{t}\right)^2 = r$$

Solve for g :

$$\frac{1}{2}g + 9 = f$$

$$2(f - 9) = g$$

Solve for x :

$$7x + 2a = 3x + 5a$$

$$4x = 3a$$

$$x = \frac{3}{4}a$$

Solve for r :

$$V = \frac{4}{3}\pi r^3$$

$$\sqrt[3]{\frac{3V}{4\pi}} = r$$