

Section 1.5: Rewriting Equations and Formulas

literal equation: an equation that contains more than one variable

Common Formulas

Temperature F = degrees Fahrenheit, C = degrees Celsius

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

Simple Interest I = interest, P = principal,

r = annual interest rate (decimal form),

t = time (years)

$$I = Prt$$

Distance d = distance traveled, r = rate, t = time

$$d = rt$$

Solve the literal equation for y .

<p>1. $y - 2x = 15$</p> $\begin{array}{r} y - 2x = 15 \\ +2x \quad +2x \\ \hline \end{array}$ $y = 2x + 15$	<p>2. $4x + y = 2$</p> $\begin{array}{r} 4x + y = 2 \\ -4x \quad -4x \\ \hline \end{array}$ $y = -4x + 2$
<p>3. $5x - 2 = 8 + 5y$</p> $\begin{array}{r} 5x - 2 = 8 + 5y \\ -8 \quad -8 \\ \hline 5x - 10 = 5y \\ \frac{5x}{5} = \frac{5y}{5} \quad \frac{-10}{5} \\ \hline \end{array}$ $y = x - 2$	<p>4. $y + x = 11$</p> $\begin{array}{r} y + x = 11 \\ -x \quad -x \\ \hline \end{array}$ $y = -x + 11$
<p>5. $3x - y = -4$</p> $\begin{array}{r} 3x - y = -4 \\ -3x \quad -3x \\ \hline -y = -3x - 4 \\ \frac{-y}{-1} = \frac{-3x}{-1} \quad \frac{-4}{-1} \\ \hline \end{array}$ $y = 3x + 4$	<p>6. $3x + 1 = 7 - 4y$</p> $\begin{array}{r} 3x + 1 = 7 - 4y \\ -7 \quad -7 \\ \hline 3x - 6 = -4y \\ \frac{3x}{-4} = \frac{-6}{-4} \quad \frac{-4y}{-4} \\ \hline \end{array}$ $y = \frac{-3}{4}x + \frac{3}{2}$

Solve the formula for the indicated variable.

<p>7. Area of a triangle: $A = \frac{1}{2}bh$; Solve for b.</p> $\cancel{2} \cdot \frac{1}{2}bh = A \cdot \cancel{2}$ $\frac{bh}{h} = \frac{2A}{h}$ $b = \frac{2A}{h}$	<p>8. Volume of a cone: $V = \frac{1}{3}\pi r^2 h$; Solve for h.</p> $\cancel{3} \cdot \frac{1}{3}\pi r^2 h = V \cdot \cancel{3}$ $\frac{\pi r^2 h}{\pi r^2} = \frac{3V}{\pi r^2}$ $h = \frac{3V}{\pi r^2}$
<p>9. Ohm's Law: $I = \frac{V}{R}$; Solve for R.</p> $R \cdot I = \frac{V}{\cancel{R}} \cdot \cancel{R}$ $\frac{R \cdot I}{I} = \frac{V}{I}$ $R = \frac{V}{I}$	<p>10. Ideal Gas Law: $PV = nRT$; Solve for R.</p> $\frac{nRT}{nT} = \frac{PV}{nT}$ $R = \frac{PV}{nT}$

11. The amount A of money in an account after simple interest has been earned is given by the formula $A = P + Prt$ where P is the principal, r is the annual interest rate in decimal form, and t is the time in years.

<p>a. Solve the formula for r.</p> $\frac{P + Prt}{-P} = \frac{A}{-P}$ $\frac{\cancel{P} + \cancel{P}rt}{\cancel{P}t} = \frac{A - P}{\cancel{P}t}$ $r = \frac{A}{Pt} - \frac{1}{t}$	<p>b. Solve the formula for P.</p> $P + Prt = A$ $\frac{P(1 + rt)}{(1 + rt)} = \frac{A}{(1 + rt)}$ $P = \frac{A}{(1 + rt)}$
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