Learning Target: I can solve literal equations.

Monitoring Progress 1-6

Solve the literal equation for $y$.

1. $2x - 2y = 5$

\[
\begin{align*}
\frac{2x}{2} - \frac{2y}{2} &= \frac{5}{2} \\
\frac{2x - 2y}{2} &= \frac{5}{2} \\
2x - 2y &= 5
\end{align*}
\]

2. $y = \frac{2x}{2}$

$y = \frac{5}{2}$

Solve the literal equation for $x$.

3. $3x - 2y = 5$

\[
\begin{align*}
3x &= 5 + 2y \\
\frac{3x}{3} &= \frac{5 + 2y}{3} \\
x &= \frac{5 + 2y}{3}
\end{align*}
\]

Example 3

The formula for the surface area $S$ of a rectangular prism is $S = 2\ell w + 2\ell h + 2wh$. Solve the formula for the length $\ell$.

\[
\begin{align*}
S &= 2\ell w + 2\ell h + 2wh \\
S - 2wh &= 2\ell w + 2\ell h \\
\frac{S - 2wh}{2w + 2h} &= \ell
\end{align*}
\]

Core Concept

Common Formulas

Temperature

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

Simple Interest

$I = PRT$

Distance

$d = rt$

Solve the formula for the indicated variable.

7. Area of a triangle: $A = \frac{1}{2}bh$; Solve for $h$.

8. Surface area of a cone: $S = \pi r^2 + \pi rl$; Solve for $l$.

Monitoring Progress 7-8

Example 5

Solve the temperature formula for $F$.

\[
\begin{align*}
F &= \frac{9}{5}C + 32 \\
\frac{9}{5}C &= F - 32 \\
c &= \frac{5}{9}(F - 32)
\end{align*}
\]

\[
\begin{align*}
\frac{9}{5}(30) + 32 &= F \\
54 + 32 &= F \\
m&= 86^\circ F
\end{align*}
\]
Which has the greater surface temperature: Mercury or Venus?

\[ F = \frac{9}{5}C + 32 \]

Mercury: 427°C = 800.6°F
Venus: 869°F

Example 6

You deposit $5,000 in an account that earns simple interest. After 6 months, the account earns $162.50 in interest. What is the annual interest rate?

\[
\frac{I}{Pt} = r
\]

\[
\frac{162.50}{(5,000)(6)} = 0.055
\]

Example 7

A truck driver averages 60 miles per hour while delivering freight and 45 miles per hour on the return trip. The total driving time is 7 hours. How long does each trip take?

\[
\frac{d}{r} = t
\]

\[
d + d = 60 \cdot 6.5 = 45 \cdot t
\]

\[
d = 300
\]

\[
\frac{d}{300} = \frac{60}{250} = \frac{60 \cdot 20}{300} = 4
\]

\[
11d = 1980
\]

\[
d = 180
\]

Example 8

10. How much money must you deposit in a simple interest account to earn $500 in interest in 5 years at 4% annual interest?

11. A truck driver averages 60 miles per hour while delivering freight and 45 miles per hour on the return trip. The total driving time is 7 hours. How long does each trip take?

Exit Ticket: Solve 2x + 4y = 11 for y.

Closure