Solving Proportions with an Unknown

To solve a proportion that contains an unknown, cross-multiply and solve the resulting equation. Check your answer in the original problem.

Solve: \( \frac{4}{6} = \frac{x}{18} \)

\[
\begin{align*}
\frac{4}{6} &= \frac{x}{18} \\
(4)(18) &= 6x \\
72 &= 6x \\
\frac{72}{6} &= \frac{6x}{6} \\
12 &= x \\
\end{align*}
\]

Check: \( \frac{4}{6} = \frac{x}{18} \)

\[
\begin{align*}
\frac{4}{6} &= \frac{x}{18} \\
4(18) &= 6(12) \\
72 &= 72 \\
\end{align*}
\]

PRACTICE

Solve.

\[
\begin{array}{ccc}
a & b & c \\
\frac{5}{10} = \frac{10}{x} & \frac{5}{12} = \frac{10}{x} & \frac{25}{3} = \frac{100}{x} \\
5x = 10(10) & 5x = 10(12) & 5x = 100 \\
5x = 100 & 5x = 120 & \frac{5x}{5} = \frac{100}{5} \\
x = 20 & x = 20 & x = 20 \\
\frac{7}{9} = \frac{21}{x} & \frac{4}{15} = \frac{8}{x} & \frac{5}{8} = \frac{x}{16} \\
\frac{5}{x} = \frac{15}{9} & \frac{20}{x} = \frac{5}{4} & \frac{x}{12} = \frac{25}{3} \\
\frac{12}{4} = \frac{x}{7} & \frac{x}{4} = \frac{5}{10} & \frac{x}{20} = \frac{4}{5} \\
\end{array}
\]