

# MATH SKILL INFORMATION PAGE

## Algebra

For use with 3-1 through 3-2

## SOLVING EQUATIONS

### CONCEPTS:

- Equality:
    - if  $a = b$ , then  $a + c = b + c$ .
    - If  $a = b$ , then  $ac = bc$ .
  - Undo the operation.
  - Get the  $x$  alone (isolate the  $x$ ; move everything except the  $x$  to one side of the equation).
  - You can do anything to one side of an equation ( $=$ ) as long as you do the exact same thing to the other side of the equation.
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### A. ADDING AND SUBTRACTING:

#### Example 1:

$$\begin{aligned}x + 20 &= 8 \\x + 20 - 20 &= 8 - 20 \\x &= -12\end{aligned}$$

#### Example 2:

$$\begin{aligned}x - 7 &= 23 \\x - 7 + 7 &= 23 + 7 \\x &= 30\end{aligned}$$

#### Example 3: *Translate to an equation and solve.*

Four less than a number is 18. Find the number.

$$\begin{aligned}x - 4 &= 18 \\x - 4 + 4 &= 18 + 4 \\x &= 22\end{aligned}$$

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### B. MULTIPLYING AND DIVIDING:

#### Example 4:

$$\begin{aligned}3x &= 21 \\ \frac{3x}{3} &= \frac{21}{3} \\ x &= 7\end{aligned}$$

#### Example 5:

$$\begin{aligned}\frac{x}{5} &= 4 \\ 5 \cdot \frac{x}{5} &= 4 \cdot 5 \\ x &= 20\end{aligned}$$

#### Example 5a:

$$\begin{aligned}\frac{1}{5} \cdot x &= 4 \\ \frac{5}{1} \cdot \frac{1}{5} \cdot x &= 4 \cdot \frac{5}{1} \\ x &= 20\end{aligned}$$

#### Example 6:

$$\begin{aligned}\frac{3x}{5} &= 24 \\ \frac{5}{3} \cdot \frac{3x}{5} &= 24 \cdot \frac{5}{3} \\ x &= 40\end{aligned}$$

#### Example 7: *Translate to an equation and solve.*

A mechanic works on a car for 7 hours. He earns \$245. How much was his hourly pay?

$$7x = 245$$

$$\frac{7x}{7} = \frac{245}{7}$$

$$x = 35 \quad \text{The mechanic earned } \$35 \text{ per hour.}$$