Algebra 1 2.8
Solve equations for given variables.
Use formulas to solve real-world problems

variable
equation
literal equation
solve for...
formula
dimensional analysis

How do we solve equations?

$$x + 3 = 5$$
$$-3 \quad -3$$
$$x = 2$$

$$\frac{2 \cdot n}{2} = \frac{12}{2}$$
$$n = 6$$

$$2x + 5 = 9$$
$$-5 \quad -5$$
$$\frac{2x}{2} = \frac{4}{2}$$
$$x = 2$$

$$2(x - 3) = 5x + 13$$
$$2x + -6 = 5x + 13$$
$$-2x \quad -2x$$
$$-6 = 3x + 13$$
$$-13 \quad -13$$
$$\frac{-19}{3} = \frac{3x}{3}$$
$$x = \frac{-19}{3}$$

$$x - 2 = 0$$
$$+2 \quad +2$$
$$x = 2$$

Example 1 Solve for a Specific Variable

Solve $4m - 3n = 8$ for m.

$4m - 3n = 8$

$+3n \quad +3n$

$\frac{4m}{4} = \frac{3n}{4} + \frac{8}{4}$

$m = \frac{3}{4}n + 2$

Solve each equation for the variable indicated.

1A. $15 = 3n + 6p$, for n $m = .75n + 2$ **1B.** $\frac{k-2}{5} = 11j$, for k

$-6p \quad -6p$

$\frac{-6p + 15}{3} = \frac{2 \cdot n}{3}$

$-2p + 5 = n$ $n = -2p + 5$

$5 \cdot \frac{(k+2)}{5} = 11j \cdot 5$

$1(k-2) = 55j$

$k - 2 = 55j$

$+2 \quad +2$

$K = 55j + 2$

8. $u = vw + z$, for v

9 $x = b - cd$, for c

10. $fg - 9h = 10j$, for g

11. $10m - p = -n$, for m

$u = vw + z$

$-z \quad -z$

$\frac{u-z}{w} = \frac{vw}{w}$

$v = \frac{u}{w} - \frac{z}{w}$

$x = b - cd$

$-b \quad -b$

$\frac{x-b}{d} = \frac{-cd}{d}$

$-c = -1c$

$\frac{x}{-1 \cdot d} - \frac{b}{-1 \cdot d} = \frac{-1c}{-1}$

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

$fg - 9h = 10j$

$+9h \quad +9h$

$\frac{fg}{f} = \frac{10j}{f} + \frac{9h}{f}$

$g = \frac{10j}{f} + \frac{9h}{f}$

$10m - p = -n$

$+p \quad +p$

$\frac{10m}{10} = \frac{p}{10} - \frac{n}{10}$

$m = \frac{p}{10} - \frac{n}{10}$

12. $r = \frac{2}{3}t + v$, for t

13. $\frac{5}{9}v + w = z$, for v

14. $\frac{10ac - x}{11} = -3$, for a

15. $\frac{df + 10}{6} = g$, for f