

NAME _____

DATE _____

SOLVE LINEAR EQUATIONS: Worksheet 1

Simplify each expression using the distributive property.

1) $4(x + 5)$

2) $-3(4y + 1)$

3) $3(-2w - 6)$

Solve these one-step equations.

4) $x - 18 = 4$

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

6) $t + 13 = 6$

7) $6n = 72$

Solve these two-step equations.

8) $7x - 8 = 27$

9) $-4y + 2 = 10$

10) $\frac{t}{5} + 9 = 14$

11) $8r - 7 = -39$

Solve these multi-step equations.

12) $4(y + 2) + 3y = 36$

13) $-2(x - 5) - 4x = -38$

14) $12(2w - 3) + 4w + 6 = -58$

15) $2(3t - 1) + 5(8t - 2) = 126$

Solve these multi-step equations with variables on both sides.

16) $4(z + 2) = 2(z - 6)$

17) $-2(5y - 1) = 8y + 2y + 7$

18) $3(x + 2) = 3(x + 1)$

19) $9(w + 1) = 6(w - 2) + 2w$

20) $6(r + 2) = 3(2r + 4)$

KEY

SOLVE LINEAR EQUATIONS: Worksheet 1

Simplify each expression using the distributive property.

1) $4(x+5)$
 $4x + 20$

2) $-3(4y+1)$
 $-12y - 3$

3) $3(-2w-6)$
 $-6w - 18$

Solve these one-step equations.

4) $x - 18 = 4$

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

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

$$\begin{aligned} \frac{y}{-2} &= 5 \\ \frac{y}{-2} \cdot -2 &= 5 \cdot -2 \\ y &= -10 \end{aligned}$$

6) $t + 13 = 6$

$$\begin{aligned} t + 13 &= 6 \\ t + 13 - 13 &= 6 - 13 \\ t &= -7 \end{aligned}$$

7) $6n = 72$

$$\begin{aligned} 6n &= 72 \\ \frac{6n}{6} &= \frac{72}{6} \\ n &= 12 \end{aligned}$$

Solve these two-step equations.

8) $7x - 8 = 27$

$$\begin{aligned} 7x - 8 &= 27 \\ 7x - 8 + 8 &= 27 + 8 \\ 7x &= 35 \\ \frac{7x}{7} &= \frac{35}{7} \\ x &= 5 \end{aligned}$$

9) $-4y + 2 = 10$

$$\begin{aligned} -4y + 2 &= 10 \\ -4y + 2 - 2 &= 10 - 2 \\ -4y &= 8 \\ \frac{-4y}{-4} &= \frac{8}{-4} \\ y &= -2 \end{aligned}$$

10) $\frac{t}{5} + 9 = 14$

$$\begin{aligned} \frac{t}{5} + 9 &= 14 \\ \frac{t}{5} + 9 - 9 &= 14 - 9 \\ \frac{t}{5} &= 5 \\ \frac{t}{5} \cdot 5 &= 5 \cdot 5 \\ t &= 25 \end{aligned}$$

11) $8r - 7 = -39$

$$\begin{aligned} 8r - 7 &= -39 \\ 8r - 7 + 7 &= -39 + 7 \\ 8r &= -32 \\ \frac{8r}{8} &= \frac{-32}{8} \\ r &= -4 \end{aligned}$$

Solve these multi-step equations.

12) $4(y + 2) + 3y = 36$

$$\begin{aligned} 4(y + 2) + 3y &= 36 \\ 4y + 8 + 3y &= 36 \\ 7y + 8 &= 36 \\ 7y + 8 - 8 &= 36 - 8 \\ 7y &= 28 \\ y &= 4 \end{aligned}$$

13) $-2(x - 5) - 4x = -38$

$$\begin{aligned} -2(x - 5) - 4x &= -38 \\ -2x + 10 - 4x &= -38 \\ -6x + 10 &= -38 \\ -6x + 10 - 10 &= -38 - 10 \\ -6x &= -48 \\ x &= 8 \end{aligned}$$

14) $12(2w - 3) + 4w + 6 = -58$

$$\begin{aligned} 12(2w - 3) + 4w + 6 &= -58 \\ 24w - 36 + 4w + 6 &= -58 \\ 28w - 30 &= -58 \\ 28w - 30 + 30 &= -58 + 30 \\ 28w &= -28 \\ w &= -1 \end{aligned}$$

15) $2(3t - 1) + 5(8t - 2) = 126$

$$\begin{aligned} 2(3t - 1) + 5(8t - 2) &= 126 \\ 6t - 2 + 40t - 10 &= 126 \\ 46t - 12 &= 126 \\ 46t - 12 + 12 &= 126 + 12 \\ 46t &= 138 \\ t &= 3 \end{aligned}$$

Solve these multi-step equations with variables on both sides.

16) $4(z + 2) = 2(z - 6)$

$$\begin{aligned} 4(z + 2) &= 2(z - 6) \\ 4z + 8 &= 2z - 12 \\ 4z + 8 - 2z &= 2z - 12 - 2z \\ 2z + 8 &= -12 \\ 2z + 8 - 8 &= -12 - 8 \\ 2z &= -20 \\ z &= -10 \end{aligned}$$

17) $-2(5y - 1) = 8y + 2y + 7$

$$\begin{aligned} -2(5y - 1) &= 8y + 2y + 7 \\ -10y + 2 &= 10y + 7 \\ -10y + 2 - 10y &= 10y + 7 - 10y \\ -20y + 2 &= 7 \\ -20y &= 5 \\ y &= -\frac{1}{4} \end{aligned}$$

18) $3(x + 2) = 3(x + 1)$

$$\begin{aligned} 3(x + 2) &= 3(x + 1) \\ 3x + 6 &= 3x + 3 \\ 3x + 6 - 3x &= 3x + 3 - 3x \\ 6 &= 3 \\ \text{No solution} \end{aligned}$$

19) $9(w + 1) = 6(w - 2) + 2w$

$$\begin{aligned} 9(w + 1) &= 6(w - 2) + 2w \\ 9w + 9 &= 6w - 12 + 2w \\ 9w + 9 &= 8w - 12 \\ 9w + 9 - 8w &= 8w - 12 - 8w \\ w + 9 &= -12 \\ w + 9 - 9 &= -12 - 9 \\ w &= -21 \end{aligned}$$

20) $6(r + 2) = 3(2r + 4)$

$$\begin{aligned} 6(r + 2) &= 3(2r + 4) \\ 6r + 12 &= 6r + 12 \\ 6r + 12 - 6r &= 6r + 12 - 6r \\ 12 &= 12 \end{aligned}$$

All real numbers