Algebra 1A

Warm-Up
Simplify.

(a) $2x = 5 + 3x$

$$\boxed{5x-5}$$

(b) $4x + 3(x-2)+1$

$4x - 3x + 6 + 1$

$$\boxed{x+7}$$

(c) $3x + 2(x+2)$

$3x - 2x - 4$

$$\boxed{x-4}$$

(d) $4(x+3)$

$$\boxed{4x+12}$$

Steps for Solving

1. Simplify each side of the equal sign (distribute and collect like terms)

2. Use OPPOSITE operations in the OPPOSITE order

3. Give your answer as an $x =$ (or $y =$, $t =$, etc.)

Example 1. Solve an Equation by Combining Like Terms
Solve.

(a) $9x + x - 7 = 13$

$$10x - 7 = 13$$
$$\quad\; +7 \quad +7$$
$$\overline{\quad 10x = 20 \quad}$$
$$\quad \tfrac{10x}{10} \quad \tfrac{20}{10}$$

$$\boxed{x=2}$$

(b) $9d - 2d + 4 = 32$

$$7d + 4 = 32$$
$$\quad -4 \quad -4$$
$$\overline{\quad 7d = 28 \quad}$$
$$\quad \tfrac{7d}{7} \quad \tfrac{28}{7}$$

$$\boxed{d=4}$$

Example 2. Solve an Equation by Using the Distributive Property
Solve.

(a) $2w + 3(w+4) = 27$

$$2w + 3w + 12 = 27$$
$$5w + 12 = 27$$
$$\quad -12 \quad -12$$
$$\overline{\quad 5w = 15 \quad}$$
$$\quad \tfrac{5w}{5} \quad \tfrac{15}{5}$$

$$\boxed{w=3}$$

(b) $4x + 7(x-2) = 26$

$$4x - 7x + 14 = 26$$
$$-3x + 14 = 26$$
$$\quad -14 \quad -14$$
$$\overline{\quad -3x = 12 \quad}$$
$$\quad \tfrac{-3x}{-3} \quad \tfrac{12}{-3}$$

$$\boxed{x=-4}$$

Try It!
Solve.

(a) $11v - 9 - 7v = 15$

$$4v - 9 = 15$$
$$\quad +9 \quad +9$$
$$\overline{\quad 4v = 24 \quad}$$
$$\quad \tfrac{4v}{4} \quad \tfrac{24}{4}$$

$$\boxed{v=6}$$

(b) $14 + 2(4g-3) = 40$

$$14 + 8g - 6 = 40$$
$$8 + 8g = 40$$
$$-8 \qquad\quad -8$$
$$\overline{\quad 8g = 32 \quad}$$
$$\quad \tfrac{8g}{8} \quad \tfrac{32}{8}$$

$$\boxed{g=4}$$

(c) $6x + 2(x-5) = 46$

$$6x - 2x + 10 = 46$$
$$4x + 10 = 46$$
$$\quad -10 \quad -10$$
$$\overline{\quad 4x = 36 \quad}$$
$$\quad \tfrac{4x}{4} \quad \tfrac{36}{4}$$

$$\boxed{x=9}$$

Example 3. Multiply by a Reciprocal to Solve

Solve $\frac{3}{5}(2x-4)=18$.

$\frac{5}{3}\cdot\frac{3}{5}(2x-4)=\overset{6}{\underset{1}{18}}\cdot\frac{5}{3}$

$2x-4=30$

$+4+4$

$\dfrac{2x=34}{2}\dfrac{}{2}$

$\boxed{x=17}$

Using the Distributive Property

$\frac{3}{5}(\frac{2x}{1}-\frac{4}{1})=18$

$(5)\left(\frac{6}{5}x-\frac{12}{5}\right)=(18)(5)$

$6x-12=90$

$+12+12$

$\dfrac{6x=102}{6}\dfrac{}{6}$

$\boxed{x=17}$

Example 4. More Multiply by a Reciprocal

Solve $-\frac{4}{5}(4a-1)=28$

$\left(-\frac{5}{4}\right)\left(-\frac{4}{5}(4a-1)\right)=\overset{7}{\underset{1}{28}}\left(-\frac{5}{4}\right)$

$4a-1=-35$

$+1+1$

$\dfrac{4a=-34}{4}\dfrac{}{4}$

$\boxed{a=-8\frac{1}{2}}$

Example 5. Problem Solving

Tickets for a Pistons game can be purchased online through Ticketmaster. For one section at the Palace tickets are $32.50 for each seat, plus a convenience charge of $3.30 for each ticket. No matter how many tickets are ordered there is a processing fee of $5.90. If a customer's total order costs $220.70, how many tickets did they order?

$x(32.50+3.30)+5.90=220.70$

$35.80x+5.90=220.70$

$-5.90-5.90$

$\dfrac{35.80x}{35.80}=\dfrac{214.80}{35.80}$

$x=6$

They ordered 6 tickets for the Pistons game.

Assignment: Pages 150 - 151 (4 – 32) even

Review:

Solve the equation. Show work.

1. $8-y=-9$

2. $8b=5$

3. $\frac{3}{4}q=24$

4. The sum of three numbers is 123. The second number is 9 less than two times the first number. The third number is 6 more than three times the first number. Find the three numbers.

5. The bill (parts and labor) for the repair of a car was $458. The cost of parts was $339. The cost of labor was $34 per hour. Write and solve an equation to find the number of hours of labor.