NAME_____ DATE _____   **1**

1. The equation $3x - 4 = 11$ is solved as shown. Describe the inverse operations used in each step.

$$3x - 4 = 11$$

Step 1: $3x - 4 + 4 = 11 + 4$

$$3x = 15$$

Step 2: $\dfrac{3x}{3} = \dfrac{15}{3}$

$$x = 5$$

In Step 1, 4 was added to both sides of the equation to undo the subtraction.

In Step 2, both sides of the equation were divided by 3 to undo multiplication.

Solve each equation.

2. $2x - 7 = 19$

   $2x - 7 + 7 = 19 + 7$

   $2x = 26$

   $\dfrac{2x}{2} = \dfrac{26}{2}$

   $x = 13$

3. $\dfrac{2}{3}x - 4 = 1\dfrac{1}{4}$

   $\dfrac{2}{3}x - 4 + 4 = 1\dfrac{1}{4} + 4$

   $\dfrac{2}{3}x = 5\dfrac{1}{4}$

   $\dfrac{3}{2}\left(\dfrac{2}{3}x\right) = \dfrac{3}{2}\left(5\dfrac{1}{4}\right)$

   $x = 7\dfrac{7}{8}$

4. Determine if there is one solution, no solution, or an infinite number of solutions.

   $2(3x + 4) - (x - 8) = 3(4x + 2) - 7x + 10$

   $2(3x + 4) - (x - 8) = 3(4x + 2) - 7x + 10$

   $6x + 8 - x + 8 = 12x + 6 - 7x + 10$

   $5x + 16 = 5x + 16$

   Infinite solutions

5. Monica bought 3 types of fruit for a fruit salad. She paid twice as much for blueberries as for oranges, and $1.50 less for strawberries than for blueberries.

   a. Define a variable and write algebraic expressions to represent the amount she spent on each type of fruit.

   Let c be the amount she spent on oranges; $2c$ represents the cost of blueberries; $2c - 1.50$ represents the cost of strawberries.

1

b. If the total cost was \$12.25, how much did Monica spend on each type of fruit?

$$c + 2c + (2c - 1.50) = 12.25$$
$$5c - 1.5 = 12.25$$
$$5c = 13.75$$
$$c = 2.75$$

She spent \$2.75 on oranges, $2(2.75) = \$5.50$ on blueberries, and $5.50 - 1.50 = \$4.00$ on strawberries.

Solve and check each equation.

6. $\dfrac{6(2x - 1)}{5} = -18$

$$5\left(\dfrac{6(2x - 1)}{5}\right) = 5(-18)$$
$$6(2x - 1) = -90$$
$$12x - 6 = -90$$
$$12x - 6 + 6 = -90 + 6$$
$$12x = -84$$
$$\dfrac{12x}{12} = -\dfrac{84}{12}$$
$$x = -7$$

Check:

$$\dfrac{6(2(-7) - 1)}{5} \stackrel{?}{=} -18$$
$$\dfrac{6(-14 - 1)}{5} \stackrel{?}{=} -18$$
$$\dfrac{6(-15)}{5} \stackrel{?}{=} -18$$
$$\dfrac{-90}{5} \stackrel{?}{=} -18$$
$$-18 = -18$$

7. $\dfrac{-2(5x + 4)}{3} = -3(3x + 2) - \dfrac{7}{3}$

$$3\left(\dfrac{-2(5x + 4)}{3}\right) = 3\left(-3(3x + 2) - \dfrac{7}{3}\right)$$
$$-2(5x + 4) = -9(3x + 2) - 7$$
$$-10x - 8 = -27x - 18 - 7$$
$$-10x - 8 = -27x - 25$$
$$-10x - 8 + 8 = -27x - 25 + 8$$
$$-10x = -27x - 17$$
$$-10x + 27x = -27x - 17 + 27x$$
$$17x = -17$$
$$x = -1$$

Check:

$$\dfrac{-2(5(-1) + 4)}{3} \stackrel{?}{=} -3(3(-1) + 2) - \dfrac{7}{3}$$
$$\dfrac{-2(-5 + 4)}{3} \stackrel{?}{=} -3(-3 + 2) - \dfrac{7}{3}$$
$$\dfrac{-2(-1)}{3} \stackrel{?}{=} -3(-1) - \dfrac{7}{3}$$
$$\dfrac{2}{3} \stackrel{?}{=} 3 - \dfrac{7}{3}$$
$$\dfrac{2}{3} = \dfrac{2}{3}$$