Unit 2: Lesson 02 **Solving two-step linear equations**

In the process of solving some equations it is necessary to **both** add a number to both sides **and** then divide (or multiply) both sides by another number in order to "get *x* by itself."

Example 1: Solve 5x – 7 = 3

$$5x - 7 = 3$$
$$+7 \quad +7$$
$$5x = 10$$
$$\frac{5x}{5} = \frac{10}{5}$$
$$x = \boxed{2}$$

Example 2: Solve y/2 + 12 = 30

$$\frac{y}{2} + 12 = 30$$
$$-12 \quad -12$$
$$\frac{y}{2} = 18$$
$$\frac{y}{2} \cdot \frac{2}{1} = 18 \cdot 2$$
$$y = \boxed{36}$$

Example 3: Solve 8 = –3m – 10

$$8 = -3m - 10$$
$$10 \qquad\qquad +10$$
$$18 = -3m$$
$$\frac{18}{1}\left(-\frac{1}{3}\right) = -\frac{3}{1}\left(-\frac{1}{3}\right)m$$
$$-\frac{18}{3} = m$$
$$\boxed{-6} = m$$

Example 4: Solve 6.4z – 13.2 = 38

$$6.4z - 13.2 = 38$$
$$+13.2 \quad 13.2$$
$$6.4z = 51.2$$
$$\frac{6.4z}{6.4} = \frac{51.2}{6.4}$$
$$z = \boxed{8}$$

Example 5: Solve $4 = -11 + \dfrac{p}{-5}$

$$4 = -11 + \frac{p}{-5}$$
$$\underline{11} \qquad \underline{+11}$$
$$15 = \frac{p}{-5}$$
$$15(-5) = \frac{p}{-5}\left(\frac{-5}{1}\right)$$
$$\boxed{-75} = p$$

Example 6: Solve $20 - (1/7)c = -9$

$$20 - \frac{1}{7}c = -9$$
$$\underline{-20} \qquad\qquad \underline{-20}$$
$$-\frac{1}{7}c = -29$$
$$-\frac{1}{7}\cdot\frac{7}{1}c = \frac{-29}{1}\cdot\frac{-7}{1}$$
$$c = \boxed{203}$$

Assignment: Solve for the indicated variable in the following problems.

1. $11x + 2 = 35$

2. $8 = 2b - 22$

3. $100 = 5x - 35$

4. $11 - 6v = -49$

5. $6 - 4h = -22$

6. $-32 = 4t - 16$

7. $.5x - 6 = -1$

8. $2.7d + 11.6 = 19.7$

9. $(4/5)n - 7 = -4$

10. $\dfrac{x}{-6} + 4 = 12$

11. $10 = \dfrac{v}{-2} - 4$

12. $2/3 = (-1/6)g - 1/3$

13. $(4/5)x - 9 = 8$

14. $-20 = 10 + (2/3)h$

15. $-19 = 11 - \dfrac{1}{6}x$

16. $7 - (3/8)x = -1$

17. $8p - 11 = 5$

18. $4/5 = 9 - (1/2)x$