6.R.2 Exercises

Concept Check

True/False. Determine whether each statement is true or false. If a statement is false, explain how it can be changed so the statement will be true. (**Note:** There may be more than one acceptable change.)

1. If an equation of the form $ax + b = c$ uses decimal or fractional coefficients, the addition and multiplication principles of equality cannot be used.

2. The first step in solving $2x + 3 = 9$ is to add 3 to both sides.

3. To solve an equation that has been simplified to $4x = 12$, you need to multiply both sides by $\frac{1}{4}$, or divide both sides by 4.

4. When solving a linear equation with decimal coefficients, one approach is to multiply both sides in such a way to give integer coefficients before solving.

Practice

Solve each equation.

5. $3x + 11 = 2$

6. $-5x + 2.9 = 3.5$

7. $\frac{2}{5} - \frac{1}{2}x = \frac{7}{4}$

8. $\frac{y}{3} - \frac{2}{3} = 7$

Applications

Solve.

9. ***Music:*** The tickets for a concert featuring the new hit band, Flying Sailor, sold out in 2.5 hours. If there were 35,000 tickets sold, solve the equation $35{,}000 - 2.5x = 0$ to find the number of tickets sold per hour.

10. ***Movies:*** All snacks (candy, popcorn, and soda) cost \$3.50 each at the local movie theater. Admission tickets cost \$7.50 each. After a long week, Carlos treats himself to a night at the movies. His movie night budget is \$25 and he spends all his movie money. Solve the equation $\$3.50x + \$7.50 = \$25.00$ to determine how many snacks Carlos can buy.

11. ***Standard Score:*** Solve the following equation involving the standard score formula for x given $z = 2$, $\mu = 135.2$, and $\sigma = 11.1$.

$$z = \frac{x - \mu}{\sigma}$$

12. ***Probability:*** In probability, the probability of all possible outcomes of an event must add to 1. Suppose there are 6 possible outcomes of an event. One of the outcomes has a probability of 0.25. The other five outcomes all have the same probability. Solve the equation $5p + 0.25 = 1$ to find the probability of each of the other five outcomes.

Writing & Thinking

13. Find the error(s) made in solving each equation and give the correct solution.

a.

$$\frac{1}{3}x+4=9$$
$$3\cdot\frac{1}{3}x+4=3\cdot 9$$
$$x+4=27$$
$$x+4-4=27-4$$
$$x=23$$

b.

$$5x+3=11$$
$$(5x-3)+(3-3)=11-3$$
$$2x+0=8$$
$$\frac{2x}{2}=\frac{8}{2}$$
$$x=4$$