

Lesson 9 Practice Problems

1. A car has a 16-gallon fuel tank. When driven on a highway, it has a gas mileage of 30 miles per gallon. The gas mileage (also called "fuel efficiency") tells us the number of miles the car can travel for a particular amount of fuel (one gallon of gasoline, in this case). After filling the gas tank, the driver got on a highway and drove for a while.
 - a. How many miles has the car traveled if it has the following amounts of gas left in the tank?
 - i. 15 gallons
 - ii. 10 gallons
 - iii. 2.5 gallons
 - b. Write an equation that represents the relationship between the distance the car has traveled in miles, d , and the amount of gas left in the tank in gallons, x .
 - c. How many gallons are left in the tank when the car has traveled the following distances on the highway?
 - i. 90 miles
 - ii. 246 miles
 - d. Write an equation that makes it easier to find the the amount of gas left in the tank, x , if we know the car has traveled d miles.
2. The area A of a rectangle is represented by the formula $A = lw$ where l is the length and w is the width. The length of the rectangle is 5.

Write an equation that makes it easy to find the width of the rectangle if we know the area and the length.

3. Noah is helping to collect the entry fees at his school's sports game. Student entry costs \$2.75 each and adult entry costs \$5.25 each. At the end of the game, Diego collected \$281.25.

Select **all** equations that could represent the relationship between the number of students, s , the number of adults, a , and the dollar amount received at the game.

A. $281.25 - 5.25a = 2.75s$

B. $a = 53.57 - \frac{2.75}{5.25}s$

C. $281.25 - 5.25s = a$

D. $281.25 + 2.75a = s$

E. $281.25 + 5.25s = a$

4. $V = \pi r^2 h$ is an equation to calculate the volume of a cylinder, V , where r represents the radius of the cylinder and h represents its height.

Which equation allows us to easily find the height of the cylinder because it is solved for h ?

A. $r^2 h = \frac{V}{\pi}$

B. $h = V - \pi r^2$

C. $h = \frac{V}{\pi r^2}$

D. $\pi h = \frac{V}{r^2}$

5. The data represents the number of hours 10 students slept on Sunday night.

6 6 7 7 7 8 8 8
8 9

Are there any outliers? Explain your reasoning.

(From Unit 1, Lesson 14.)

6. The table shows the volume of water in cubic meters, V , in a tank after water has been pumped out for a certain number of minutes.

time after pumping begins	volume of water (cubic meters)
0	30
5	27.5
10	20
15	7.5

Which equation could represent the volume of water in cubic meters after t minutes of water being pumped out?

- A. $V = 30 - 2.5t$
- B. $V = 30 - 0.5t$
- C. $V = 30 - 0.5t^2$
- D. $V = 30 - 0.1t^2$

(From Unit 2, Lesson 4.)

7. A catering company is setting up for a wedding. They expect 150 people to attend. They can provide small tables that seat 6 people and large tables that seat 10 people.
- a. Find a combination of small and large tables that seats exactly 150 people.
 - b. Let x represent the number of small tables and y represent the number of large tables. Write an equation to represent the relationship between x and y .
 - c. Explain what the point $(20, 5)$ means in this situation.
 - d. Is the point $(20, 5)$ a solution to the equation you wrote? Explain your reasoning.

(From Unit 2, Lesson 5.)

8. Which equation has the same solution as $10x - x + 5 = 41$?

- A. $10x + 5 = 41$
- B. $10x - 5 + x = 41$
- C. $9x = 46$
- D. $9x + 5 = 41$

(From Unit 2, Lesson 6.)

9. Noah is solving an equation and one of his moves is unacceptable. Here are the moves he made.

$2(x + 6) - 4 = 8 + 6x$	original equation
$2x + 12 - 4 = 8 + 6x$	apply the distributive property
$2x + 8 = 8 + 6x$	combine like terms
$2x = 6x$	subtract 8 from both sides
$2 = 6$	divide each side by x

Which answer best explains why the “divide each side by x step” is unacceptable?

- A. When you divide both sides of $2x = 6x$ by x you get $2x^2 = 6x^2$.
- B. When you divide both sides of $2x = 6x$ by x it could lead us to think that there is no solution while in fact the solution is $x = 0$.
- C. When you divide both sides of $2x = 6x$ by x you get $2 = 6x$.
- D. When you divide both sides of $2x = 6x$ by x it could lead us to think that there is no solution while in fact the solution is $x = 3$.

(From Unit 2, Lesson 7.)

10. Lin says that a solution to the equation $2x - 6 = 7x$ must also be a solution to the equation $5x - 6 = 10x$.

Write a convincing explanation about why this is true.

(From Unit 2, Lesson 7.)