

LESSON

13 Solving Equations

Review It!

When you solve equations, remember this:

inverse operation an operation that undoes a given operation

Addition and subtraction are inverse operations.
Multiplication and division are inverse operations.

To solve an equation, remove the numbers from the side with the variable until the variable is alone.

Solve: $7x + 17 = 38$

Step 1 Identify the operations on the same side as x .
+ means _____
 $7x$ means _____ 7 and x .

Step 2 Get the x term alone on one side.

$$7x + 17 = 38$$

$$7x + 17 - 17 = 38 - \underline{\hspace{2cm}}$$

$$7x = \underline{\hspace{2cm}}$$

REMEMBER Subtract the same number from both sides.

Step 3 Get x alone on one side.

$$7x = 21$$

$$7x \div 7 = 21 \div \underline{\hspace{2cm}}$$

$$x = \underline{\hspace{2cm}}$$

REMEMBER Divide both sides by the same number.

So, the solution is _____.

Lesson 13: Solving Equations

Try It!

Get the variable alone on one side.



1. $2x = 2$ 2. $3d = 6$ 3. $4n = 4$

4. $\frac{x}{3} = 2$ 5. $z + 7 = -1$ 6. $d - 13 = -3$

1.
How can you undo multiplication?
subtract, or divide?

5.
What is $-1 - 7$?
 -6 , or -8 ?

7.
 x is multiplied by what?
3, or 11?

Write the solution.

7. $3x + 11 = 17$ _____ 8. $5x - 2 = 23$ _____

9. $10c + 6 = 46$ _____ 10. $-7x - 25 = 10$ _____

11. $9x + 13 = 85$ _____ 12. $6b - 12 = 60$ _____

13. $\frac{x}{-3} + 2 = 4$ _____ 14. $-5z + 3 = 28$ _____

Solve.

15. Pedro found the length of a rectangular pen by solving the equation $7l + 9 = 37$, where l is the length of the pen. What is the length of the pen, in yards? _____

15.
What do you subtract first from both sides?
7, or 9?

16. A balloon ride over Savannah costs \$315. The equation $75h + 15 = 315$ can be used to find the number of hours, h , for the ride. How many hours was the ride? _____

Algebra

On Your Own!

Circle the best answer for each solution.

1. Solve: $4x = 12$
 A. 3 C. 16
 B. 8 D. 48
2. Solve: $5x = -45$
 A. -45 C. -9
 B. -40 D. 9
3. Solve: $8x = 56$
 A. 448 C. 64
 B. 48 D. 7
4. Solve: $\frac{x}{-4} = 2$
 A. -8 C. 2
 B. -2 D. 8
5. Solve: $x - 6 = -3$
 A. -18 C. -2
 B. -3 D. 3
6. Solve: $\frac{x}{6} + 1 = 0$
 A. 6 C. $-\frac{1}{6}$
 B. $\frac{1}{6}$ D. -6
7. Solve: $3x + 14 = 50$
 A. 8 C. $21\frac{1}{3}$
 B. 12 D. 63
8. Solve: $15x - 6 = 39$
 A. $4\frac{13}{45}$ C. $3\frac{13}{45}$
 B. 4 D. 3
9. Solve: $\frac{x}{2} - 9 = 7$
 A. -4 C. 32
 B. 8 D. 34
10. Solve: $\frac{x}{14} + 1 = 1$
 A. -14 C. 1
 B. 0 D. 2
11. Maria spent \$45 at an amusement park in Atlanta. The equation $5r + 15 = 45$ can be used to find the number of Maria's rides, r . How many rides did Maria take?
 A. 3 C. 9
 B. 6 D. 12
12. Joe said you can find the width of a frame by solving the equation $8w + 3 = 9$, where w is the width in feet. What is the width of the frame?
 A. $\frac{3}{4}$ foot C. $1\frac{1}{2}$ feet
 B. $1\frac{1}{3}$ feet D. 48 feet

13. It costs \$1,280 to build a fence around a peach orchard. The equation $8f + 80 = 1,280$ can be used to find the number of feet, f , of fencing.

Part A How many feet of fencing are needed for the orchard?

Part B Use what you know about solving equations to explain why your answer is correct. Use words and/or numbers to support your explanation.

Math Words

Fill in the blanks.

14. To solve the equation $3x + 15 = 7$, first _____ 15 from both sides of the equation.
15. Multiplication is the _____ operation of division.
16. $A(n)$ _____ is a math sentence that uses an equal sign.
17. Subtraction is the _____ operation of addition.