

## Chapter 3 - Equations - Chapter 3 Practice Test

**ENTERTAINMENT** Suppose you pay \$15 per hour to go horseback riding. You ride 2 hours today and plan to ride 4 more hours this weekend.

1. Write two different expressions to find the total cost of horseback riding.

$$15(2 + 4), 15(2) + 15(4)$$

2. Find the total cost.

$$\begin{aligned} 15(2 + 4) &= 15(6) \\ &= \$90 \end{aligned}$$

**Simplify each expression.**

3.  $x + 3x$

$$\begin{aligned} x + 3x &= (1 + 3)x \\ &= 4x \end{aligned}$$

4.  $9x + 5 - x + 3$

$$\begin{aligned} 9x + 5 - x + 3 &= (9 - 1)x + 8 \\ &= 8x + 8 \end{aligned}$$

5.  $10(y + 3) - 4y$

$$\begin{aligned} 10(y + 3) - 4y &= 10y + 10(3) - 4y \\ &= (10 - 4)y + 30 \\ &= 6y + 30 \end{aligned}$$

6.  $-7b - 5(b - 4)$

$$\begin{aligned} -7b - 5(b - 4) &= -7b - 5b - 5(-4) \\ &= (-7 - 5)b + 20 \\ &= -12b + 20 \end{aligned}$$

7. **MUSIC** Omar and Deb each have a digital music player. Deb has 37 more songs on her player than Omar has on his player. Write an expression in simplest form that represents the total number of songs on both players.

Let  $x$  be the number of songs on Omar's player. Then Deb has  $x + 37$  on her player. The total on both players is:

$$\begin{aligned} x + x + 37 &= (1 + 1)x + 37 \\ &= 2x + 37 \end{aligned}$$

**Solve each equation. Check your solution.**

8.  $19 = f + 5$

$$19 = f + 5$$

$$19 - 5 = f + 5 - 5$$

$$14 = f$$

Check:  $19 = f + 5$

$$19 \stackrel{?}{=} f + 5 - 5$$

$$19 = 19 \checkmark$$

The solution is 14.

9.  $-15 + z = 3$

$$-15 + z = 3$$

$$-15 + 15 + z = 3 + 15$$

$$z = 18$$

Check:  $-15 + z = 3$

$$-15 + 18 \stackrel{?}{=} 3$$

$$3 = 3 \checkmark$$

The solution is 18.

10.  $x - 7 = 16$

$$x - 7 = 16$$

$$x - 7 + 7 = 16 + 7$$

$$x = 23$$

Check:  $x - 7 = 16$

$$23 - 7 \stackrel{?}{=} 16$$

$$16 = 16 \checkmark$$

The solution is 23.

11.  $g - 9 = -10$

$$g - 9 = -10$$

$$g - 9 + 9 = -10 + 9$$

$$g = -1$$

Check:  $g - 9 = -10$

$$-1 - 9 \stackrel{?}{=} -10$$

$$-10 = -10 \checkmark$$

The solution is -1.

12.  $-8y = 72$

$$-8y = 72$$

$$\frac{-8y}{-8} = \frac{72}{-8}$$

$$y = -9$$

Check:  $-8y = 72$

$$-8(-9) = 72$$

$$72 = 72 \checkmark$$

The solution is  $-9$ .

13.  $\frac{n}{-30} = -6$

$$\frac{n}{-30} = -6$$

$$\frac{n}{-30}(-30) = -6(-30)$$

$$n = 180$$

Check:  $\frac{n}{-30} = -6$

$$\frac{180}{-30} = -6$$

$$-6 = -6 \checkmark$$

The solution is  $180$ .

14.  $25 = 2d - 9$

$$25 = 2d - 9$$

$$25 + 9 = 2d - 9 + 9$$

$$34 = 2d$$

$$\frac{34}{2} = \frac{2d}{2}$$

$$17 = d$$

Check:  $25 = 2d - 9$

$$25 = 2(17) - 9$$

$$25 = 34 - 9$$

$$25 = 25 \checkmark$$

The solution is  $17$ .

15.  $4w - 18 = -34$

$$4w - 18 = -34$$

$$4w - 18 + 18 = -34 + 18$$

$$4w = -16$$

$$\frac{4w}{4} = \frac{-16}{4}$$

$$w = -4$$

Check:  $4w - 18 = -34$

$$4(-4) - 18 \stackrel{?}{=} -34$$

$$-16 - 18 \stackrel{?}{=} -34$$

$$-34 = -34 \checkmark$$

The solution is  $-4$ .

16.  $6v + 10 = -62$

$$6v + 10 = -62$$

$$6v + 10 - 10 = -62 - 10$$

$$6v = -72$$

$$\frac{6v}{6} = \frac{-72}{6}$$

$$v = -12$$

Check:  $6v + 10 = -62$

$$6(-12) + 10 \stackrel{?}{=} -62$$

$$-72 + 10 \stackrel{?}{=} -62$$

$$-62 = -62 \checkmark$$

The solution is  $-12$ .

17.  $-7 = \frac{d}{-5} + 1$

$$-7 = \frac{d}{-5} + 1$$

$$-7 - 1 = \frac{d}{-5} + 1 - 1$$

$$-8 = \frac{d}{-5}$$

$$-8(-5) = \frac{d}{-5}(-5)$$

$$40 = d$$

Check:  $-7 = \frac{d}{-5} + 1$

$$-7 \stackrel{?}{=} \frac{40}{-5} + 1$$

$$-7 \stackrel{?}{=} -8 + 1$$

$$-7 = -7 \checkmark$$

The solution is 40.

18.  $x + 7 - 2x = 18$

$$x + 7 - 2x = 18$$

$$(1 - 2)x + 7 = 18$$

$$-x + 7 = 18$$

$$-x + 7 - 7 = 18 - 7$$

$$-x = 11$$

$$x = -11$$

Check:  $x + 7 - 2x = 18$

$$-11 + 7 - 2(-11) \stackrel{?}{=} 18$$

$$-11 + 7 + 22 \stackrel{?}{=} 18$$

$$18 = 18 \checkmark$$

The solution is -11.

19.  $b - 7b + 6 = -30$

$$b - 7b + 6 = -30$$

$$b + (-7b) + 6 = -30$$

$$-6b + 6 = -30$$

$$-6b + 6 - 6 = -30 - 6$$

$$-6b = -36$$

$$\frac{-6b}{-6} = \frac{-36}{-6}$$

$$b = 6$$

Check:

$$b - 7b + 6 = -30$$

$$6 - 7(6) + 6 = -30$$

$$6 - 42 + 6 = -30$$

$$6 + (-42) + 6 = -30$$

$$6 + 6 + (-42) = -30$$

$$12 + (-42) = -30$$

$$-30 = -30 \checkmark$$

The solution is 6.

20. **TRAVEL** Ms. Carter is renting a car from an agency that charges \$20 per day plus \$0.15 per mile. She has a budget of \$80 per day. Use the equation  $80 = 20 + 0.15m$  to find the maximum number of miles she can drive each day.

$$80 = 20 + 0.15m$$

$$80 - 20 = 20 + 0.15m - 20$$

$$60 = 0.15m$$

$$\frac{60}{0.15} = \frac{0.15m}{0.15}$$

$$m = 400$$

She can drive 400 miles per day.

21. **GENETICS** Approximately one-seventh of the people in the world are left-handed. Write and solve an equation to estimate how many people in the United States are left-handed if the population of the United States is about 300 million.

Let  $l$  be the number left handed people in millions, and let  $p$  be the total population in millions.

$$l = \frac{1}{7}p$$

$$l = \frac{1}{7}(300)$$

$$l \approx 43$$

There are about 43 million lefties in the United States.

22. **MULTIPLE CHOICE** A carpet store advertises 16 square yards of carpeting for \$300, which includes the \$60 installation charge. Which equation could be used to determine the cost of one square yard of carpet  $x$ ?
- A  $16x = 300$
  - B  $x + 60 = 300$
  - C  $60x + 16 = 300$
  - D  $16x + 60 = 300$

The equation should include a  $16x$  term. This eliminates B and C. Choice A doesn't include the \$60 installation charge. So, the correct equation is D.

23. **MULTIPLE CHOICE** In the sequence below, which expression can be used to find the value of the term in the  $n$ th position?

Position	Value
1	5
2	14
3	23
4	32
$n$	?

- F  $5n$
- G  $5n + 4$
- H  $9n$
- J  $9n - 4$

The common difference between consecutive terms is 9. A term is equal to 9 times the position number minus 4.

$$t = 9n - 4$$

The correct answer is J.

24. Find the perimeter and area of the rectangle.



$$P = 2(\ell + w)$$

$$P = 2(48 + 20)$$

$$P = 2(68)$$

$$P = 136$$

The perimeter is 136 m.

$$A = \ell w$$

$$A = 48 \cdot 20$$

$$A = 960$$

The area is  $960 \text{ m}^2$ .

25. **MULTIPLE CHOICE** The rectangle below has a length of 20 centimeters and a perimeter of  $P$  centimeters. Which equation could be used to find the width of the rectangle?



**A**  $P = 40 + \frac{w}{2}$

**B**  $P = 40 + 2w$

**C**  $P = 20 + w$

**D**  $P = 20 + 2w$

$P = 2(1 + w)$

$P = 2(20 + w)$

$P = 2(20) + 2w$

$P = 40 + 2w$

The correct answer is B.