

Chapter 3

Quiz

For use after Section 3.2

Identify the terms, coefficients, and constants of the expression.

1. $5h + 9$

2. $a^2 + 2 + 7b$

Answers

1. _____

Write the expression using exponents.

3. $r \cdot r \cdot r \cdot r \cdot r \cdot r$

4. $4 \cdot d \cdot d \cdot d$

Evaluate the expression when $a = 4$, $b = 2$, and $c = 8$.

5. $a + 7$

6. bc

7. $\frac{c}{a}$

2. _____

Complete the table.

8.

x	$x \cdot 3$
2	
4	
6	

9.

x	$4x - 1$
1	
3	
5	

3. _____

4. _____

5. _____

6. _____

7. _____

Write the phrase as an expression.

10. the sum of 25 and 14

11. a number y divided by 78. See left.12. a number x multiplied by 313. 4 less than a number w 9. See left.

10. _____

14. The expression $m \div 4$ is the distance each person runs in a relay race that is m miles. How far does each person run in a relay race that is 12 miles?

11. _____

12. _____

15. The expression $18h + 100p$ represents the amount (in dollars) that an insurance salesperson earns for working h hours and selling p policies. How much does the salesperson earn for working 10 hours and selling 3 policies?

13. _____

14. _____

15. _____

16. Your school rents a dunking booth for a carnival. The company charges \$55 to rent the booth plus \$20 for each hour of rental.

16. a. _____

b. _____

a. Write an expression for the cost of renting the dunking booth for h hours.

b. Use your expression to find the cost of 6 hours.

**Chapter
3**

Quiz

For use after Section 3.4

Tell which property the statement illustrates.

1. $6 + (4 + x) = (6 + 4) + x$ 2. $5 \cdot (3 \cdot z) = (5 \cdot 3) \cdot z$

Simplify the expression. Explain each step.

3. $3.5 + (x + 2.7)$ 4. $(8 \cdot k) \cdot 4$

Use the Distributive Property and mental math to find the product.

5. 5×49 6. 8×56

Use the Distributive Property to simplify the expression.

7. $7(x + 3)$ 8. $6(8 - x)$

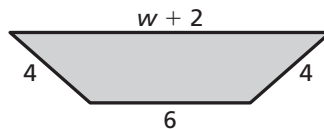
Simplify the expression.

9. $2(6 + 3n) - 4$ 10. $5a + 7 - 3a - 2$

Factor the expression using the GCF.

11. $24 - 9$ 12. $14x + 63$

13. The perimeter of a trapezoid is $6 + 4 + (w + 2) + 4$. Simplify the expression.



14. To convert a temperature from degrees Celsius to degrees Fahrenheit, you can use the formula $F = (C \cdot 1.8) + 32$ where F is degrees Fahrenheit and C is degrees Celsius. What is the temperature (in degrees Fahrenheit) of water that is 10 degrees Celsius?
15. You and three friends go to a baseball game. You each pay \$2 for a drink and x dollars for nachos.
- a. Use the Distributive Property to write and simplify an expression for the total the group pays.
- b. How much does the group pay when the nachos cost \$3?

Answers

1. _____
 2. _____
 3. **See left.**
 4. **See left.**
 5. _____
 6. _____
 7. _____
 8. _____
 9. _____
 10. _____
 11. _____
 12. _____
 13. _____
 14. _____
 15. a. _____
 b. _____

Chapter 3

Test A

Evaluate the expression when $x = 4$ and $y = 1$.

1. $5y$

2. $12 - x$

Answers

1. _____

2. _____

Write the phrase as an expression.

3. 10 multiplied by 7

4. the sum of 12 and a number h

3. _____

Write the phrase as an expression. Then evaluate the expression when $x = 3$ and $y = 6$.

5. the product of 8 and a number x 6. the quotient of a number y and 2

4. _____

5. _____

6. _____

Tell which property the statement illustrates.

7. $7 \cdot m = m \cdot 7$

8. $0 + z = z$

7. _____

9. $3(x - 3) = 3x - 9$

8. _____

10. $(c + 1.4) + 0.5 = c + (1.4 + 0.5)$

9. _____

Simplify the expression. Explain each step.

11. $2 + (g + 5)$

12. $7(4p)$

10. _____

11. See left.12. See left.

13. _____

14. _____

15. _____

Use the Distributive Property to simplify the expression.

13. $4(c - 2)$

14. $8(x - 1)$

16. _____

17. _____

Simplify the expression.

15. $2(3 + d - 1)$

16. $3(w + 1) - 1$

18. _____

19. _____

17. $3.4n + 9.6 - 2.1n$

18. $5(k + 4) - 2k$

20. _____

21. _____

Factor the expression using the GCF.

19. $4 + 22$

20. $54 - 30$

22. _____

21. $12y - 8$

22. $9b + 45$

**Chapter
3**

Test A (continued)

23. Complete the table.

p	1	2	3	4	5
$3p - 1$					

24. The running time (in minutes) of a TV episode is $30 - 0.5c$, where c is the number of commercials aired during the episode. What is the running time of an episode with 15 commercials?
25. To find the sales tax on an item, divide the price of the item by 20.
- Write an algebraic expression to find the sales tax on an item that costs d dollars.
 - Find the sales tax on a television that costs \$800.
26. A server at a restaurant works 5 hours on a weekday and 8 hours on a weekend day.
- Write an expression for the total hours the server works on x weekdays and y weekend days.
 - Use the expression to find the number of hours the server works on 4 weekdays and 2 weekend days.
27. The sides of a square each have a length of $11x$ inches. Write an expression for the perimeter of the square (in inches).
28. The cost of a DVD (in dollars) can be represented by the expression $18 - d$, where d is the discount amount. Use the Distributive Property to write and simplify an expression for the cost of 3 DVDs.

Answers

23. See left.
24. _____
25. a. _____
b. _____
26. a. _____
b. _____
27. _____
28. _____

Chapter 3

Test B

Evaluate the expression when $x = 6$ and $y = 5$.

1. $x + y - 4$

2. $2(8 - y)$

3. $\frac{18}{x}$

4. $(x - 1)(y - 1)$

Write the phrase as an expression. Then evaluate the expression when $a = 2$ and $b = 7$.

5. the total of a number a and a number b 6. 9 increased by a number a 7. a number b plus the quotient of 8 and a number a 8. the product of 4 and the difference of 10 and a number b

Tell which property is illustrated by the statement.

9. $0 + x = x$

10. $3 + z = z + 3$

11. $8(1) = 8$

12. $(2 \cdot 5)c = 2(5 \cdot c)$

13. $0t = 0$

14. $5(x - 2) = 5x - 10$

Simplify the expression. Explain each step.

15. $\frac{1}{3} \cdot q \cdot 3$

16. $(3.2b + 0.8) + 1.9b$

Simplify the expression.

17. $11(3 - m)$

18. $4(6a + 7 - a)$

19. $2\frac{1}{4} + \frac{1}{2}\left(h + \frac{3}{4}\right)$

20. $6a - 2b + 3(a - b)$

Answers

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

13. _____

14. _____

15. **See left.**16. **See left.**

17. _____

18. _____

19. _____

20. _____

Chapter 3 **Test B** (continued)

Factor the expression using the GCF.

21. $27k - 6$

22. $5x + 60y$

23. Complete the table.

w	0	2	4	6	8
$20 - \frac{w}{2}$					

24. A car travels 45 miles on one gallon of gas.

- a. Write an algebraic expression to find the distance the car can travel using x gallons of gas.
- b. The car uses 10 gallons of gas. How many miles does it travel?

25. You are hiking in an area with steep trails. It takes you twice as long to hike uphill as it takes you to hike downhill. When you get to the bottom of the trail, you take a 30-minute break. On your way back up the trail, you take a 15-minute break.

- a. Write an expression for the total time of your hike in hours. Explain what the terms represent in the expression.
- b. Evaluate the expression to find the total time of a hike when the trip downhill takes 1.25 hours.
- c. The next time you want to bike a trail, it will take only one and a half times as long to bike uphill as it takes to bike downhill. The breaks will stay the same. Explain how you would change the expression. Then evaluate the expression to find the total time when the trip downhill takes 2 hours.

26. The width of a widescreen TV is 18 inches greater than its height h . Use the Distributive Property to write and simplify an expression for the area of the TV screen.

Answers

21. _____

22. _____

23. See left.

24. a. _____

b. _____

25. a. See left.

b. _____

c. See left.

26. _____

**Chapter
3****Cumulative Assessment**

- An ice cream shop charges \$3.39 for a dish of ice cream. A customer can also order toppings for \$0.59 each. If x represents the number of toppings, which expression can be used to determine the total charge, in dollars, for a dish of ice cream with x toppings?
 - $339x + 0.59$
 - $3.39 + 0.59x$
 - $3.98 + x$
 - $3.98x$
- The world's tallest living man is $8\frac{1}{4}$ feet tall and the world's shortest living man is $1\frac{3}{4}$ feet tall. How many times taller is the tallest living man than the shortest living man?
 - $4\frac{5}{7}$
 - $8\frac{3}{16}$
 - $8\frac{1}{3}$
 - $14\frac{7}{16}$
- GRIDDED RESPONSE** A player's score in the game of horseshoes is based on the number of "ringers" r and the numbers of horseshoes closest to the stake c that a player throws. Use the formula below to determine the score of a player who throws 4 ringers and 7 horseshoes closest to the stake.
$$3r + c$$
- Which equation is true for all numbers a ?
 - $a + 0 = a$
 - $a + 1 = 1$
 - $a \times 0 = a$
 - $a \times 1 = 1$
- Sheryl earns money for college by walking dogs and by mowing lawns. She earns \$3 for each dog she walks and \$25 for each lawn she mows. Which expression can be used to determine the amount of money, in dollars, Sheryl earns from walking w dogs and mowing m lawns?
 - $3w + 25m$
 - $3w + 25$
 - $28(w + m)$
 - $75(w + m)$
- Which number is equivalent to the expression $(89)(46)$?
 - 880
 - 890
 - 3094
 - 4094

Chapter 3

Cumulative Assessment (continued)

7. The steps Irena took to simplify an expression are shown below. What should Irena change in order to simplify the expression correctly?

$$\begin{aligned} 12(48 + 24) &= 12 \times 48 + 24 \\ &= 576 + 24 \\ &= 600 \end{aligned}$$

- F. Multiply 48 and 24 by 12. H. Divide 48 and 24 by 12.
- G. Add 12 to $(48 + 24)$. I. Multiply 24 by $(48 + 12)$.
8. Hector wants to calculate the quotient $23.7 \div 1.58$ by converting the divisor to a whole number. Which of the following quotients is equivalent to $23.7 \div 1.58$?
- A. $158 \overline{)23.7}$ C. $158 \overline{)2370}$
- B. $158 \overline{)237}$ D. $1580 \overline{)2370}$

9. **EXTENDED RESPONSE** The total cost, in cents, to operate an electrical appliance can be represented by the formula below.

$$\frac{Wtc}{1000}$$

In the formula, W represents the number of watts used by an appliance, t represents the time, in hours, the appliance is used, and c represents the cost, in cents, per kilowatt-hour used. Brianne uses two appliances frequently.

The electricity provider charges Brianne's family 10 cents per kilowatt-hour used.

Part A On a typical day, Brianne uses her computer for 3 hours and her hair dryer for 10 minutes. What is the total cost of using both appliances for 6 days? Show your work.



300 watts



1800 watts

Total cost using both appliances for 6 days: _____ cents

Part B To save money, Brianne reduces her computer usage by 1 hour per day and only uses her hair dryer every other day. How much money will the family save in 60 days? Show your work and explain your reasoning.

Money saved: \$ _____

1. **A.** The student writes an expression that multiplies the cost of a dish of ice cream by the number of toppings and represents the cost per topping as a one-time charge.
B. Correct answer
C. The student adds the charges for a dish of ice cream and one topping and then adds the number of toppings to this sum.
D. The student adds the charges for a dish of ice cream and one topping and then multiplies this sum by the number of toppings.
2. **F.** Correct answer
G. The student divides the whole number parts and multiplies the fraction parts of each mixed number.
H. The student divides the whole number parts and fractions parts of the mixed numbers separately.
I. The student multiplies the two mixed numbers.
3. Correct answer: 19
Common error: The student makes an order of operations error by first adding 4 and 7 and then multiplying 3 by this sum to get $3(4 + 7) = 33$.
4. **A.** Correct answer
B. The student misapplies the multiplication property of one to the operation of addition, thinking that one added to any number equals one.
C. The student misapplies the addition property of zero to the operation of multiplication, thinking that any number multiplied by zero equals the number itself.
D. The student misapplies the multiplication property of one, thinking that any number multiplied by one equals one.
5. **F.** Correct answer
G. The student does not multiply the earnings per lawn by the number of lawns mowed, representing the earnings per lawn as a one-time charge.
H. The student adds the earnings per dog and the earnings per lawn and then multiplies this sum by the sum of the number of dogs and the number of lawns.
I. The student multiplies the earnings per dog by the earnings per lawn and then multiplies this product by the sum of the number of dogs and the number of lawns.
6. **A.** The student lines up the digits incorrectly and forgets to add the carried 1 when adding the products in the vertical multiplication algorithm.
B. The student lines up the digits incorrectly when adding the products in the vertical multiplication algorithm.
C. The student forgets to add the carried 1 when adding the two products in the vertical multiplication algorithm.
D. Correct answer

7. **F.** Correct answer
- G.** The student thinks that a number next to a quantity in parentheses represents the operation of addition.
- H.** The student thinks that a number next to a quantity in parentheses represents the operation of division.
- I.** The student thinks that the 24 should be distributed instead of the 12.
8. **A.** The student multiplies the divisor by 100 but leaves the dividend as is.
- B.** The student multiplies both the divisor and the dividend by the smallest power of 10 necessary to convert each to a whole number, but doesn't use the same power of 10 for both.
- C.** Correct answer
- D.** The student attempts to multiply both the divisor and the dividend by 100 but accidentally multiplies the divisor by 1000.
9. **4 points** The student demonstrates a thorough understanding of evaluating expressions. The student substitutes all values correctly and simplifies all expressions correctly to get an answer of 72 cents for Part A and \$2.70 for Part B. The student shows accurate, complete work for both parts and provides a clear and complete explanation for Part B.
- 3 points** The student demonstrates an understanding of evaluating expressions, but the student's work and explanations demonstrate an essential but less than thorough understanding.
- 2 points** The student demonstrates a partial understanding of evaluating expressions. The student's work and explanations demonstrate a lack of essential understanding.
- 1 point** The student demonstrates very limited understanding of evaluating expressions. The student's response is incomplete and exhibits many flaws.
- 0 points** The student provided no response, a complete incorrect or incomprehensible response, or a response that demonstrates insufficient understanding of evaluating expressions.

**Chapter
3****Alternative Assessment**

1. Make a list or table of the properties that you studied in this chapter. For each property, write an expression with one variable that illustrates the property. Next, use the property to simplify the expression. Then describe a situation that could be represented by your simplified expression, choose an appropriate value for the variable, and evaluate the expression.
2. The length of your square bathroom floor is 9 feet.
 - a. A contractor is tiling your floor with one-foot square tiles. How many tiles are needed for the job?
 - b. The row of tiles on the edge of the floor have a design, and all of the inside tiles are white. Draw a sketch of the floor. How many tiles have a design? How many tiles are white?
 - c. The cost of each tile with a design is more expensive than the cost of each white tile. Write an expression to determine the cost of the tiles for the floor.
 - d. A tile with a design is \$1.25 and a white tile is \$1.00. Find the total cost of the tiles.
 - e. The cost to tile your bathroom is the sum of the cost of the tiles, \$20 for all other materials, and labor, which is \$20 per hour. Write and simplify an expression to determine the total cost to tile your bathroom.
 - f. Find the total cost to tile your bathroom if the contractor spends 2.5 hours on the job.

**Chapter
3****Alternative Assessment Rubric**

Score	Conceptual Understanding	Mathematical Skills	Work Habits
4	Shows complete understanding of: <ul style="list-style-type: none"> • writing expressions • evaluating expressions • mathematical properties 	Shows all work. Answers all questions correctly.	Answers all parts of each problem. Work is neat and well organized.
3	Shows nearly complete understanding of: <ul style="list-style-type: none"> • writing expressions • evaluating expressions • mathematical properties 	Shows most work. Makes one or two computational errors.	Answers all parts of each problem. Work is neat and easy to follow.
2	Shows some understanding of: <ul style="list-style-type: none"> • writing expressions • evaluating expressions • mathematical properties 	Shows some work. Makes more than two computational errors.	Answers all parts of each problem. Work is sloppy and hard to follow.
1	Shows little understanding of: <ul style="list-style-type: none"> • writing expressions • evaluating expressions • mathematical properties 	Shows very little or no work. Makes many computational errors.	Does not answer all parts of each problem. Work is sloppy and hard to follow.