



Lesson Check

Do you know HOW?

Write an algebraic expression that models each word phrase.

1. the quotient of the sum of 2 and a number b , and 3
2. the sum of the product of a number k and 4, and a number m

Evaluate each algebraic expression for $x = 3$ and $y = -2$.

3. $2x - 3y$
4. $5x + y$
5. $y - x$
6. $x + 4y$

Do you UNDERSTAND?



- © 7. **Error Analysis** A student simplified the expression as shown.

$$3p^2q + 2p - (5q + p - 2p^2q) = q^2p + 3p - 5q$$

Identify the errors and correct them.

- © 8. **Vocabulary** Explain the difference between a constant and a coefficient.
- © 9. **Compare and Contrast** How are algebraic expressions and numerical expressions alike? How are they different? Include examples to justify your reasoning.



Practice and Problem-Solving Exercises



Practice

Write an algebraic expression that models each word phrase.

10. four more than a number b
11. the product of 8 and the sum of a number x and 3
12. the quotient of the difference between 5 and a number n , and 2

Write an algebraic expression that models each situation.

13. Jenny had \$130, but she is spending \$10 per week.
14. The piggy bank contained \$25, and \$1.50 is added each day.
15. You had 250 minutes left on your cell phone, and you talk an hour a week.

Evaluate each expression for the given values of the variables.

16. $4a + 7b + 3a - 2b + 2a$; $a = -5$ and $b = 3$
17. $-k^2 - (3k - 5n) + 4n$; $k = -1$ and $n = -2$
18. $-5(x + 2y) + 15(x + 2y)$; $x = 7$ and $y = -7$
19. $4(2m - n) - 3(2m - n)$; $m = -15$ and $n = -18$

STEM Physics The expression $16t^2$ models the distance in feet that an object falls during the first t seconds after being dropped. What is the distance the object falls during each time?

20. 0.25 second
21. 0.5 second
22. 2 seconds
23. 10 seconds

◀ See Problem 1

◀ See Problem 2

◀ See Problem 3

Investing The expression $1000(1.1)^t$ represents the value of a \$1000 investment that earns 10% interest per year, compounded annually for t years. What is the value of a \$1000 investment at the end of each period?

24. 2 years

25. 3 years

26. 4 years

27. 5 years

Write an algebraic expression to model the total score in each situation. Then evaluate the expression to find the total score.



See Problem 4.

28. In the first set, the volleyball team made only 8 shots worth one point each.

29. In the last baseball game, there were two 3-run home runs and 4 hits that each scored 2 runs.

Simplify by combining like terms.



See Problem 5.

30. $5a - a$

31. $5 + 10s - 8s$

32. $-5a - 4a + b$

33. $2a + 3b + 4a$

34. $6r + 3s + 2s + 4r$

35. $0.5x - x$

36. $7b - (3a - 8b)$

37. $5 + (4g - 7)$

38. $-(3x - 4y) + x$

Evaluate each expression for the given value of the variable.

39. $x + 2x - x - 1$; $x = 2$

40. $2z + 3 + 5 - 3z$; $z = -3$

41. $3(2a + 5) + 2(3 - a)$; $a = 4$

42. $\frac{5(2k - 3) - 3(k + 4)}{3k + 2}$; $k = -2$

43. $y^2 + 3$; $y = \sqrt{7}$

44. $5c^3 - 6c^2 - 2c$; $c = -5$



45. Think About a Plan Tran's truck gets very poor gas mileage. If Tran pays \$84 to fill his truck with gas and is able to drive m miles on a full tank, what expression shows his gas cost per mile?

- What operation does "per" indicate?
- Check your expression by substituting 200 miles for m . Does your answer make sense?

Simplify by combining like terms.

46. $-a^2 + 2b^2 + \frac{1}{4}a^2$

47. $x + \frac{x^2}{2} + 2x^2 - x$

48. $\frac{y^2}{4} + \frac{y}{3} + \frac{y^2}{3} - \frac{y}{5}$

49. $-(2x + y) - 2(-x - y)$

50. $x(3 - y) + y(x + 6)$

51. $\frac{1}{2}(x^2 - y^2) - \frac{5}{2}(x^2 - y^2)$

Write an algebraic expression to model each situation.

52. Class Project The freshman class will be selling carnations as a class project. What is the class's income after it pays the florist a flat fee of \$200 and sells x carnations for \$2 each?

53. Jobs You have a summer job at a car wash. You earn \$8.50 per hour and are expected to pay a one-time fee of \$15 for the uniform. If you work x hours per week, how much will you make during the first week?



54. Reasoning Suppose you need to subtract a from b but mistakenly subtract b from a instead. How is the answer you get related to the correct answer? Explain.