Unit: Polynomials

5. A company has decided that the various boxes they need for shipments will each have a height of 4 inches (in.), a depth of $(2x-7)$ in., and a width of $(x^2-13x+11)$ in. for various values of x.

a) What simplified polynomial expression, in terms of x, can be used to describe the volume of a box, in cubic inches?

b) What simplified polynomial expression, in terms of x, can be used to describe the surface area of a box, in square inches?

Show work.

6. Which expression is equivalent to $(3k + 2)(3k – 2)$?

A. $6k^2 – 4$

B. $9k^2 – 4$

C. $9k^2 – 6k – 4$

D. $9k + 6k + 4$

7. Which expression is equivalent to $(3x^2 + 1) – (x^2 – 5x + 2)$?

A. $2x^2 – 5x + 3$

B. $2x^2 + 5x + 3$

C. $2x^2 – 5x – 1$

D. $2x^2 + 5x – 1$

8. If $d_1 = a^2 + 2a + 3$ and $d_2 = 2a^2 + a + 1$, what is the value of $2(d_1 - d_2)$?

A. $-2a^2 + 2a + 4$

B. $-2a^2 + 6a + 8$

C. $-2a^4 + 2a^2 + 4$

D. $-2a^4 + 6a^2 + 8$

9. Which expression is equivalent to $(x + 8)(x - 8)$?

A. $x^2 + 64$

B. $x^2 - 64$

C. $x^2 + 16x + 64$

D. $x^2 - 16x - 64$

10. The side length of a cube is $(b + 7)$. What is its volume?

A. $3b + 21$

B. $b^3 + 343$

C. $b^2 + 14b + 49$

D. $b^3 + 21b^2 + 147b + 343$

11. Which expression is equivalent to $(2x^2 + 4x + 1) + (3x^2 + 3x + 4)$?

A. $5x^2 + 7x + 5$

B. $5x^4 + 7x^2 + 5$

C. $6x^2 + 12x + 4$

D. $6x^4 + 12x^2 + 4$

12. Which expression is equivalent to $(2x^2 + 6x - 1) - (3x^2 - x + 3)$?

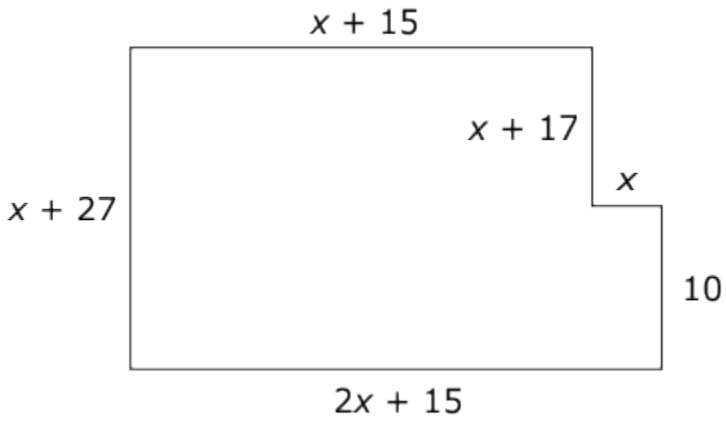
A. $-x^2 + 7x - 4$

B. $-x^2 + 7x + 2$

C. $-x^2 + 5x - 4$

D. $-x^2 + 5x + 2$

13. Which expression represents the area of the composite figure shown below?



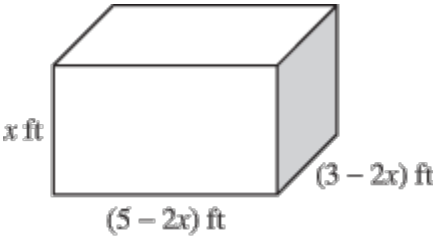
A. $x^2 + 52x + 405$

B. $x^2 + 69x + 405$

C. $2x^2 + 79x + 405$

D. $2x^2 + 87x + 405$

14. The length, width, and height of a right rectangular prism are $(5 - 2x)$ feet, $(3 - 2x)$ feet, and x feet, respectively. Which expression represents the volume of the prism?



A. $(-12x^2 + 15x)$ cubic feet

B. $(-3x + 8)$ cubic feet

C. $(4x^3 + 15x)$ cubic feet

D. $(4x^3 - 16x^2 + 15x)$ cubic feet

15. Which expression is equivalent to $(3x^2 - 5x + 4) + (2x^2 - 7)$?

A. $5x^2 - 5x - 3$

B. $5x^2 - 5x - 11$

C. $6x^2 - 5x - 3$

D. $5x^4 - 5x - 3$

16. Which expression is equivalent to $3(6x - 1)(2x + 3)$?

A. $36x^2 + 48x - 9$

B. $36x^2 + 52x - 3$

C. $36x^2 - 9$

D. $54x^2 - 3$

17. Kathy makes brownies using a square pan that has a side measure of x. She decides that she needs a new pan that is 8 inches longer on each side. Which expression represents the area of the new pan?

A. $x^2 + 16$

B. $x^2 + 64$

C. $x^2 + 2x + 16$

D. $x^2 + 16x + 64$

18. The length of a rectangle is $x + 6$. The width of the rectangle is $3x + 4$. Which expression represents the perimeter of the rectangle?

A. $4x + 10$

B. $8x + 20$

C. $4x^2 + 10$

D. $8x^2 + 10$

19. The length of a rectangle is represented by the expression $(x + 5)$. The width is represented by the expression $(x + 3)$. Which expression represents the perimeter of this rectangle?

A. $2x + 8$

B. $4x + 8$

C. $2x + 16$

D. $4x + 16$

20. The expression $5x^2 + 2x + 3$ represents the area of a square. The area of a rectangle is represented by $2x^2 + 3x + 1$. Which expression represents the combined area of the square and rectangle?

A. $7x^4 + 5x^2 + 4$

B. $3x^4 - x^2 + 2$

C. $7x^2 + 5x + 4$

D. $3x^2 - x + 2$

21. If $p(x) = x^2 + 2x - 5$ and $q(x) = x - 3$, what is $p(x) - q(x)$?

A. $2x^2 - 2$

B. $2x^2 - 8$

C. $x^2 + x - 2$

D. $x^2 + x - 8$

22. Which expression is equivalent to $(3x - 5)^2$?

A. $9x^2 - 25$

B. $9x^2 + 25$

C. $9x^2 - 15x + 25$

D. $9x^2 - 30x + 25$

23. All the rectangular public-information signs in a shopping center are built such that, for some integer x, they are $(x+4)$ feet high and (x^2-4x+7) feet wide. In order for painters to paint a sign, they must first calculate the area. Which expression represents the area, in square feet, of each sign?

A. $x^3+8x^2+23x+28$

B. $x^3-9x+28$

C. x^3-4x^2+7x

D. x^3-16x

24. Which expression is equivalent to $(7x^2-3y)^3$?

A. $343x^6-27y^3$

B. $343x^6-441x^4y+189x^2y^2-27y^3$

C. $343x^8-27y^3$

D. $343x^6-441x^8y^2+189x^4y^4-27y^3$

25. Which expression is equivalent to $(x^2-1)(x^3+1)$?

A. x^5-1

B. x^6-1

C. $x^5-x^3+x^2-1$

D. $x^6-x^3+x^2-1$

26. Which expression is equivalent to $(2x - 1)(-3x + 4)$?

A. $-x + 3$

B. $-6x^2 - 4$

C. $-6x^2 + 5x - 4$

D. $-6x^2 + 11x - 4$

27. The length and width of a rectangular park are determined by the polynomials $(3x + 4)$ and $(2x - 3)$.

- Write a polynomial expression, in the most simplified form and in terms of x, that determines the perimeter of the given park.
- What is the area of the given park, in the most simplified form and in terms of x?

Use words, numbers, and/or pictures to show your work.

28. Which of the following expressions is the simplified form of the expression below?

$$\frac{(x^3+3)(2x^3+6)-18}{2x^3} \quad \frac{(x^3\times 3)(2x^3+6)-18}{2x^3}$$

A. x^3+6x^3+6

B. x^6+6x^6+6

C. $\frac{x^6-3x^3-18}{x^3} \quad \frac{x^6-3x^3-18}{x^3}$

D. $\frac{x^9-3x^3-18}{x^3} \quad \frac{x^9-3x^3-18}{x^3}$

29. Which expression is equivalent to $(7x^2 - 5x + 1) - (x^2 - 3x - 2)$?

A. $6x^2 - 8x - 1$

B. $6x^2 - 8x + 3$

C. $6x^2 - 2x - 1$

D. $6x^2 - 2x + 3$

30. A triangle has side lengths of $5a+3$ inches and $2a+3$ inches. If the perimeter of the triangle is $9a+12$ inches, which expression represents the length, in inches, of the third side of the triangle?

A. $2a+6$

B. $-2a-6$

C. $7a+6$

D. $-7a-6$

31. Which expression is equivalent to $(2x^2 - 3x + 1) + (4x^2 - 2x - 5)$?

A. $6x^2 - 5x + 6$

B. $6x^2 - 5x - 4$

C. $6x^2 - x - 4$

D. $6x^2 - x + 6$

32. Which expression is equivalent to $(2x - 3)(x^2 - 2x + 1)$?

A. $2x^3 + 7x^2 + 8x + 3$

B. $2x^3 - x^2 + 8x - 3$

C. $2x^3 - 7x^2 + 8x - 3$

D. $2x^3 + x^2 + 8x - 3$

33. Which expression is equivalent to $(3x^2 - 2y^2)(2x^2 - y^2)$?

A. $5x^4 + 7x^2y^2 + 2y^4$

B. $5x^4 - 7x^2y^2 - 2y^4$

C. $6x^2 - 4x^2y^2 + 2y^2$

D. $6x^4 - 7x^2y^2 + 2y^4$

34. What is the degree of the product of $(3x^3+2)$ and $(4x^2-1)$?

A. 2

B. 5

C. 6

D. 12

35. What is the simplified form of the expression $(6a^5+a^2-5b^3)-(3a^3+6a^2-2b^3)$?

A. $3a^5+7a^2-7b^3$

B. $3a^5-5a^2-3b^3$

C. $6a^5-3a^3-5a^2-3b^3$

D. $6a^5-3a^3+7a^2-7b^3$

36. Which expression is equivalent to $5x(x + 2) - 3(x - 1)$?

A. $12x - 3$

B. $18x + 3$

C. $5x^2 + 13x - 3$

D. $5x^2 + 7x + 3$

37. Which expression is equivalent to $(3x + y) - (4x - 5y)$?

A. $7x + 6y$

B. $7x - 4y$

C. $-x + 6y$

D. $-x - 4y$

38. What is the product of $4x - 1$ and $3x + 5$?

A. $7x + 4$

B. $12x^2 - 5$

C. $12x^2 + 17x - 5$

D. $12x^2 + 23x - 5$

39. The functions $f(x)$ and $g(x)$ are shown below.

$$f(x) = x^2 - 7$$
$$g(x) = x^2 + 3x + 7$$

Show the algebraic processes used to determine the simplified expressions containing these functions as specified below.

Part A. Find $f(x) - g(x)$.

Part B. A function, $h(x)$, exists such that $h(x) = f(x) \cdot g(x)$. What is the equation that function $h(x)$ represents?

Use words, numbers, and/or pictures to show your work.

40. Which expression is equivalent to $(x + 2)(x + 1)$?

A. $x^2 + 2$

B. $x^2 + 3x + 2$

C. $x^2 + 3x + 3$

D. $2x^2 + 3x + 2$

41. What is the sum of $7x^4+2xy-5y^3$ and $2x^4+3xy+2y^3$?

A. $14x^8+6x^2y^2-10y^6$

B. $14x^4+6xy-10y^3$

C. $9x^8+5x^2y^2-3y^6$

D. $9x^4+5xy-3y^3$

42. What is the sum of $3x^2 + 4$ and $4x - 4$?

A. $7x^2 + 8$

B. $3x^2 + 4x$

C. $3x^2 + 4x + 8$

D. $3x^2 + 8x - 4$

43. Which expression is equivalent to $(3x + 4y) - (6x - 8y)$?

A. $-3x + 12y$

B. $-3x - 4y$

C. $9x + 12y$

D. $9x - 4y$

44. $F(x)$, a 3rd-degree polynomial, and $G(x)$, a 4th-degree polynomial, are both expressions in terms of x.

Does the function $H(x)=F(x)\cdot[F(x)+G(x)]$ also need to be a polynomial function in terms of x? If so, what degree is the function $H(x)$?

A. Yes, it is 21st-degree polynomial in terms of x.

B. Yes, it is a 12th-degree polynomial in terms of x.

C. Yes, it is a 7th-degree polynomial in terms of x.

D. No, it does not need to be a polynomial in terms of x.

45. Which expression is equivalent to the product of $3x - 5$ and $2x + 7$?

A. $6x^2 - 35$

B. $6x^2 + 11x - 35$

C. $6x^2 - 11x - 35$

D. $6x^2 + 31x - 35$

46. Which expression is equivalent to $^-6x^2(3x^2 - 5x + 3)$?

A. $^-18x^4 + 5x^2 - 18x$

B. $^-18x^4 + 30x^3 - 18x^2$

C. $^-18x^3 - 5x + 3$

D. $^-18x^3 + 30x^2 + 3$

47. What is the product of
$(3f^3 + 2gh)$ and $(4f^3 + 2gh - 5h)$?

A. $12f^6 - f^3gh - 6g^2h^2$

B. $12f^3 + 14f^3gh - 15f^3h - 6gh$

C. $12f^3 + 14f^3gh - 15f^3h + 4gh - 10gh^2$

D. $12f^6 + 14f^3gh - 15f^3h + 4g^2h^2 - 10gh^2$

48. Which expression is equivalent to $(8x^2 + 3x + 7) + (3x^2 + x - 2) - (2x + 9)$?

A. $5x^2 + x - 4$

B. $5x^2 - x + 14$

C. $11x^2 + 2x - 4$

D. $11x^2 + 6x + 14$

49. Which expression is equivalent to $(2x - 5)^2$?

A. $4x^2 + 25$

B. $4x^2 - 25$

C. $4x^2 - 20x + 25$

D. $4x^2 - 20x - 25$

50. The length of a rectangle is $(5x + 3)$ and its width is $(3x + 5)$. What expression represents the area of the given rectangle?

51. Which expression is equivalent to $(3x^2 - 6x - 4) - (x^2 + 5x - 4)$?

A. $2x^2 - 11x$

B. $2x^2 - x$

C. $2x^2 - 11x - 8$

D. $2x^2 - x - 8$

52. Which expression is equal to y, if $(x^2-1)+y=(2x^2+5)$?

A. x^2+4

B. x^2+6

C. $3x^2+4$

D. $3x^2+6$

53. The length of a rectangle is equal to $3x - 2$. The width of the rectangle is equal to $x^2 - 4x + 8$. Which expression is equal to the perimeter of the rectangle?

A. $x^2 - x + 6$

B. $x^2 - 7x + 6$

C. $2x^2 - 2x + 12$

D. $2x^2 - 14x + 12$

54. The heights and bases of two geometric shapes are modeled by the expressions shown.

Triangle: $h = 3x + 2$ and $b = 2x + 3$

Parallelogram: $h = 3x + 4$ and $b = 3x + 2$

What expression represents the number of units by which the area of the parallelogram is greater than the area of the triangle?

A. $6x^2 + 5$

B. $6x^2 + 11$

C. $6x^2 + \frac{23}{2}x + 5$

D. $6x^2 + \frac{49}{2}x + 11$

55. Which expression is equivalent to $(6x^3 + 2x^2 - 5x - 1)(3x - 7)$?

A. $18x^4 - 36x^3 - x^2 + 32x + 7$

B. $18x^4 - 36x^3 - x^2 - 38x - 7$

C. $18x^4 - 36x^3 - 29x^2 + 32x + 7$

D. $18x^4 - 36x^3 - 29x^2 - 38x - 7$

56. Which expression is equivalent to $(3x^3 + 9x + 19) + (-2x^2 - 4x + 1)$?

A. $3x^3 - 2x^2 + 5x + 20$

B. $3x^3 - 6x^2 + 19x + 1$

C. $x^3 + 13x - 20$

D. $x^3 + 5x + 20$

57. Which expression is equivalent to $6x^4 - 7x^2 - 20$?

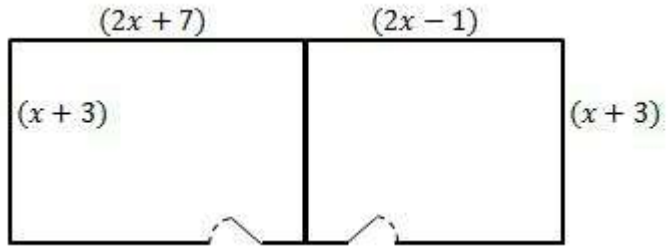
A. $(2x^2-5)(3x^2+4)$

B. $(6x^2-7)(x^2-20)$

C. $(2x^2-3x+12)+(4x^2-4x-32)$

D. $(9x^4+10x^2-10)-(3x^4-17x^2-10)$

58. Kerry wants to remodel his house by knocking down a wall between two adjoining, rectangular rooms. On the blueprints, the width of both rooms is defined by the expression $(x+3)$.



If the length of the first room is $(2x+7)$ and the length of the second room is $(2x-1)$, which expression models the area of the new room once the wall is knocked down?

A. $6x+12$

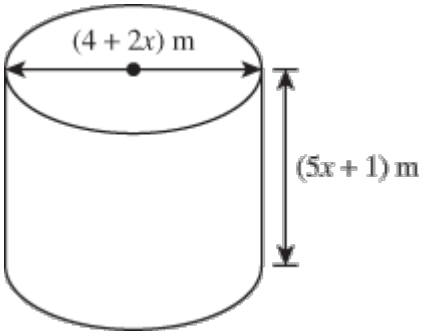
B. $4x^2+18$

C. $4x^2+13x-4$

D. $4x^2+18x+18$

59. Shown below is a right circular cylinder with a diameter of

$(4+2x)$ meters and a height of $(5x+1)$ meters.



Prove that the volume of the cylinder in terms of x is $\pi(5x^3+21x^2+24x+4)$ cubic meters.

60. Jessica had \$15. She bought 3 apples for x dollars each. Levi had \$27 and bought 5 apples for x dollars each. Which expression represents how much money both Jessica and Levi have left altogether?

A. $12 - 2x$

B. $27 - 5x$

C. $39 - 3x$

D. $42 - 8x$

61. Greg measured the lengths of the vehicles in the school parking lot. He recorded the data in the table below.

ype of Vehicle	**Length** (inches)								
Cars	160	176	173	182	163	185	180	172	175
Other Vehicles	192	95	180	202	98	208	200	105	210

What is the difference in the interquartile range for the 2 types of vehicles?

A. 97

B. 89

C. 8

D. 6

62. A square has a side length of $3x + 5$. Which expression is equivalent to the area of the square minus the perimeter of the square?

A. $9x^2 + 18x + 5$

B. $9x^2 + 18x + 45$

C. $9x^2 + 42x + 5$

D. $9x^2 + 42x + 45$

63. Which expression is equivalent to $(x + 6)(x - 5)$?

A. $x^2 - 30$

B. $x^2 - x - 30$

C. $x^2 + 11x - 30$

D. $x^2 + x - 30$

64. Which expression is equivalent to $-5x(3x - 2)$?

A. $-15x^2 + 10x$

B. $-15x^2 - 10x$

C. $15x^2 + 10x$

D. $15x^2 - 10x$

65. Which expression is equivalent to $(x - 2)(x - 6)$?

A. $x^2 + 8x + 12$

B. $x^2 + 8x - 12$

C. $x^2 - 8x + 12$

D. $x^2 - 8x - 12$

66. The total cost of tiling a rectangular patio involves the cost of tiles and labor charges. The length of the patio is 5 feet more than its width, x. If the expression $10x(x+5)+300$ gives the total cost of tiling, what does 10

represent?

A. the labor charges

B. the total cost of the tiles

C. the area of the patio in square feet

D. the cost of the tiles per square foot

67. Amy and Mary are playing a board game that uses game money with values of $5 and $10. At the end of the game, Amy has *n* bills worth $5 each and *d* bills worth $10 each, and Mary has a total of 15 bills. What does $5n + 10d$ represent?

A. total value of the bills Amy has

B. total value of the bills Mary has

C. total number of bills Amy has

D. total number of bills Mary has

68. Fat has more than twice as many calories per gram as carbohydrates and proteins. A gram of fat has about 9 calories, while a gram of carbohydrate or protein has about 4 calories. The expression below represents the total number of calories in a food item.

$$9x + 4(y + z)$$

What does the term $4(y + z)$ represent?

A. the number of grams of fat in a food item

B. the number of calories in a food item from fat

C. the number of grams of carbohydrates and proteins in a food item

D. the number of calories in a food item from carbohydrates and proteins

69. The height in meters of a projectile involves the object's initial height, upward velocity, and acceleration because of gravity. If the equation $y = -9.8t^2 + 109.7t + 7.4$ models the number of meters, y, a toy rocket is above the ground t seconds after being launched, what does 7.4 represent?

A. initial height of the rocket

B. acceleration because of gravity

C. initial upward velocity of the rocket

D. total time the rocket travels after t seconds

70. Albert invested a total of $5,000 in two different accounts. He invested part of it in Account A, which pays 7% simple interest every year, and the remaining in Account B, which pays 9% simple interest

every year. If Albert invested x dollars in Account A, what does $(5{,}000-x)0.09$ represent?

A. the amount of money in Account A in one year

B. the amount of money in Account B in one year

C. the amount of interest earned from Account A in one year

D. the amount of interest earned from Account B in one year

71. A scientist conducted an experiment to determine the effect of pressure on the boiling point temperature of pure water. The scientist collected boiling point data from several locations at different altitudes and then plotted the data. From this plot, the scientist determined that the equation $T=-0.9n+212$ could be used to represent the variation in the boiling point of pure water at the altitudes that were tested in the experiment. In this equation, T is the boiling point, in degrees Fahrenheit, and n is the number of times the altitude was increased by 500 feet.

Part A. What does the number -0.9 represent in the given context? What does the term $-0.9n$ represent in the given context?

Part B. What does the 212 in the scientist's equation represent in terms of the pressure, boiling point, and altitude?

Use words, numbers, and/or pictures to show your work.

72. George is filling a swimming pool with volume V cubic units. He observed that at time $t=t'$ the volume of the pool filled is V' and that at time $t=t''$

one-fourth of the pool was left to be filled. What does the expression $\frac{3V}{4} - V'$ represent?

A. the volume of the pool left to be filled

B. the volume of the pool filled until time $t = t''$

C. the volume of water filled in time $t = t'' - t'$

D. the volume of water filled in time $t = t' + t''$

73. A local store makes and sells handmade ceramic cookware. The store earns a profit of one dollar more on each plate sold than it earns by selling one cup. If the profit the store earns in one day on the sales of cups and plates is given by the expression, $kx + (k-1)y$, what does y represent if k is the profit earned from selling each plate?

A. the number of cups sold in one day

B. the number of plates sold in one day

C. the profit earned on the cups sold in one day

D. the profit earned on the plates sold in one day

74. A store sells two models of computers, A and B. Model A yields a profit of a dollars, and the store earns $10 more from model B than it does from model A. The total profit that the store earns in a month is given by the expression $ax + (a + 10)y$.

Part A. What do x and y represent in terms of the context?

Part B. If the profit for the next month is given by the expression $ax + (a + 10)(y + 15)$, what does $(y + 15)$ represent?

Use words, numbers, and/or pictures to show your work.

75. Look at the expression below.

$3x^2 - 6x + 7$

Which statement is true about the expression?

A. $3x^2$ is a term.

B. 7 is not a term.

C. x is a factor of all the terms.

D. 2 is the exponent of the term 3x.

76. What are the algebraic terms in the expression below?

$-4x^2y^3 + xy - 5$

A. x, y

B. 2, 3, 1, and 1

C. -4, 1, and 5

D. $-4x^2y^3$, xy, and -5

77. Which is the coefficient of the expression $-3a^2c^{-7}$?

A. -7

B. -3

C. 2

D. 3

78. Water Wizards and Pat's Pipes are two companies that offer plumbing and heating services. Both charge a base fee for all service appointments and an hourly labor rate for repairs. The two companies charge the same base fee, but Water Wizards charges a higher hourly rate than Pat's Pipes. If the total amount Water Wizards charges for x hours of repairs is modeled by the expression $45x+60$, which expression could represent the total amount Pat's Pipes would charge for the same amount of time spent on repairs?

A. $35x+60$

B. $45x+50$

C. $45x+70$

D. $55x+60$

79. The value, in dollars, of a certificate of deposit (CD) involves the initial amount invested, the interest rate, and the duration of the investment. If the expression $2.5\left(1+\frac{0.009}{365}\right)^{365x}$ models the value, in thousands of dollars, of a CD, x, days after its purchase, what does 2.5 represent?

A. the daily interest rate

B. the annual interest rate

C. the initial value of the CD in thousands of dollars

D. the most current value of the CD in thousands of dollars

80. John and Brian work for a toy manufacturer putting stuffing in teddy bears. On average, John can stuff *x* teddy bears in one day and Brian can stuff *y* teddy bears in one day. They both work the same number of days, *t*. What does the expression $(x+y)t$ represent?

A. the number of teddy bears John can stuff in *t* days

B. the number of teddy bears Brian can stuff in *t* days

C. the number of teddy bears John and Brian can stuff in *t* days

D. the number of teddy bears John and Brian can stuff in one day

81. How many algebraic terms are in the polynomial $10x^5+2x^3y^2-1$?

A. 10

B. 5

C. 3

D. 2

82. The population of a bacteria after *x* number of hours is modeled by the expression $1{,}000(0.75)^x$. What is the rate of decay of the population of bacteria?

A. 25%

B. 75%

C. 0.75%

D. 1.25%

83. In a triathlon, Agnes swims 400 meters, bikes 30 kilometers, and runs 6 kilometers. She bikes 12 times as fast as she swims and runs 5 times as fast

as she swims. The expression below represents the time it took her to complete the triathlon.

$$\frac{400}{x} + \frac{30{,}000}{12x} + \frac{6{,}000}{5x}$$

Which expression represents the time it took her to complete the swimming and biking portions of the triathlon?

A. $\frac{4{,}100}{x}$

B. $\frac{2{,}900}{x}$

C. $\frac{1{,}600}{x}$

D. $\frac{1{,}200}{x}$

84. Maria purchased a book at a discount. The discounted price of the book is modeled by the equation $a = b = xb$. What do a, b, and x most likely represent in this equation?

A. a = amount Maria paid; b = original cost of the book; x = discount percentage

B. a = original cost of the book; b = amount Maria paid; x = discount percentage

C. a = amount Maria paid; b = original cost of the book; x = total discount on the book

D. a = original cost of the book; b = amount Maria paid; x = total discount on the book

85. Which statement is true about the expression $3^5 + 4(w + 8x)$?

A. One of the coefficients is 3.

B. One of the coefficients is *w.*

C. Two of the terms have a factor of *w.*

D. Two of the terms have a factor of 4.

87. Which expression is equivalent to $4x^2 + x - 3$?

A. $(4x - 3)(x + 1)$

B. $(4x + 3)(x - 1)$

C. $(2x - 3)(2x + 1)$

D. $(2x + 3)(2x - 1)$

88. Which expression is equivalent to $x^2 + 5x - 24$?

A. $(x + 8)(x + 3)$

B. $(x - 8)(x + 3)$

C. $(x - 8)(x - 3)$

D. $(x + 8)(x - 3)$

90. Which expression is equivalent to $8x^2 + 3x - 5$?

A. $(4x - 5)(2x + 1)$

B. $(4x + 5)(2x - 1)$

C. $(8x - 5)(x + 1)$

D. $(8x + 5)(x - 1)$

91. For all $x \neq 2$, which expression is equivalent to $\frac{x^4-16}{x-2}$?

A. x^3+8

B. $(x-2)^3$

C. $\frac{(x^2-4)^2}{(x-2)}$

D. $(x+2)(x^2+4)$

92. The expression x^4-16 is equivalent to the product of $(x+2)$ and $p(x)$. Which expression could represent $p(x)$?

A. (x^3-2)

B. (x^3+8)

C. $(x^2-4)(x+2)$

D. $(x^2+4)(x-2)$

93. Which expression is equivalent to $6x^2 - 29x + 28$?

A. $(6x - 7)(x + 4)$

B. $(6x - 7)(x - 4)$

C. $(2x - 7)(3x + 4)$

D. $(2x - 7)(3x - 4)$

94. Which expression is equivalent to $6x^2 + 7x - 3$?

A. $(6x - 1)(x + 3)$

B. $(6x + 1)(x - 3)$

C. $(3x - 1)(2x + 3)$

D. $(3x - 3)(2x + 1)$

95. Which expression is equivalent to $7x^2 - 35x - 42$?

A. $7(x - 6)(x + 1)$

B. $7(x - 1)(x + 6)$

C. $7(x - 3)(x - 2)$

D. $7(x + 3)(x - 2)$

96. Which expression is equivalent to $4x^2 - 121$?

A. $(2x - 11)(2x - 11)$

B. $(2x - 11)(2x + 11)$

C. $(4x - 11)(x - 11)$

D. $(4x - 11)(x + 11)$

97. Which expression is equivalent to the expression $(x^2-y^2)^2$?

A. $(x^2+y^2)(x+y)(x-y)$

B. $(x+y)^2(x-y)^2$

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

D. x^4-y^4

98. Which expression is equivalent to $3x^2 + 4x - 15$?

A. $(3x - 5)(x + 3)$

B. $(3x + 5)(x - 3)$

C. $(3x - 1)(x + 15)$

D. $(3x + 1)(x - 15)$

100. Which expression is equivalent to $x^2 - 64$?

A. $(x - 8)(x - 8)$

B. $(x - 8)(x + 8)$

C. $(x - 4)(x - 16)$

D. $(x - 4)(x + 16)$

101. Which expression is equivalent to $2x^2 - 18x + 28$?

A. $(2x - 7)(x - 4)$

B. $(2x + 7)(x - 4)$

C. $2(x - 7)(x - 2)$

D. $2(x + 7)(x - 2)$

102. Which expression is a factor of $2x^2 - 13x + 15$?

A. $2x + 15$

B. $2x + 5$

C. $x - 5$

D. $x - 3$

103. Which expression is equivalent to $6x^2 + x - 1$?

A. $(2x - 1)(3x + 1)$

B. $(2x + 1)(3x - 1)$

C. $(6x + 1)(x - 1)$

D. $(6x - 1)(x + 1)$

104. Which expression is equivalent to $2x^2 - 18x - 20$?

A. $2(x - 20)(x + 1)$

B. $2(x - 5)(x + 4)$

C. $2(x - 1)(x + 10)$

D. $2(x - 10)(x + 1)$

105. Which expression is equivalent to $x^2 - 4y^2$?

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

B. $(x - 2y)(x - 2y)$

C. $(x + y)(x - 4y)$

D. $(x + 4y)(x - y)$

106. Which expression is equivalent to $x^2 - 49$?

A. $(x + 24.5)(x - 24.5)$

B. $(x - 24.5)(x - 24.5)$

C. $(x - 7)(x - 7)$

D. $(x - 7)(x + 7)$

107. Which expression is equivalent to $2x^2 - 72$?

A. $(2x - 9)(x - 8)$

B. $(2x - 9)(x + 8)$

C. $2(x - 6)(x - 6)$

D. $2(x - 6)(x + 6)$

108. Which expression is equivalent to $x^2 - 12x + 36$?

A. $(x + 9)(x - 4)$

B. $(x - 9)(x - 4)$

C. $(x + 6)(x - 6)$

D. $(x - 6)(x - 6)$

112. Which expression is equivalent to $4t^2 - 16$?

A. $4(t - 4)(t - 4)$

B. $4(t + 4)(t - 4)$

C. $4(t + 2)(t - 2)$

D. $4(t - 2)(t - 2)$

114. Which of the following expressions is equivalent to $25b^{16} - 64c^2$?

A. $(5b^4-8c)(5b^4-8c)$

B. $(5b^4+8c)(5b^4-8c)$

C. $(5b^8-8c)(5b^8-8c)$

D. $(5b^8+8c)(5b^8-8c)$

115. Which expression is equivalent to $x^2 - 16x + 60$?

A. $(x - 12)(x - 5)$

B. $(x + 20)(x - 3)$

C. $(x - 15)\ (x - 4)$

D. $(x - 10)(x - 6)$

117. Which expression is equivalent to $y^3 + 4y^2 - 21y$?

A. $(y^2 - 3)(y + 7)$

B. $(y^2 + 3)(y - 7)$

C. $y(y - 3)(y + 7)$

D. $y(y + 3)(y - 7)$

118. Which expression is equivalent to $121 - m^2$?

A. $(-1)(m + 11)(m + 11)$

B. $(m + 11)(m - 11)$

C. $(11 - m)(11 - m)$

D. $(11 + m)(11 - m)$

119. Which expression is equivalent to $4x^2+12xy+9y^2$?

A. $(2x+3y)^2$

B. $(4x+9y)^2$

C. $(2x)^2+(3y)^2$

D. $(4x)^2+(9y)^2$

120. If $\frac{1}{x^2+bx+c}$ can be rewritten as $\frac{1}{(x+6)(x-6)}$, where $x \neq 6$ and -6, what

are the values of b and c?

A. $b = 0, c = 36$

B. $b = 0, c = -36$

C. $b = 12, c = 36$

D. $b = -12, c = -36$

121. Which expression is a factor of $a^2 - a - 30$?

A. $a - 5$

B. $a - 2$

C. $a + 5$

D. $a + 6$

122. Which expression is equivalent to $8x^2 + 26x - 7$?

A. $(8x - 1)(x + 7)$

B. $(4x + 7)(2x - 1)$

C. $(8x + 7)(x - 1)$

D. $(4x - 1)(2x + 7)$

125. Which expression is equivalent to $100 - 4x^2$?

A. $4(5 - x)(5 + x)$

B. $4(5 - x)^2$

C. $4(x - 5)^2$

D. $4(x + 5)(x - 5)$

126. Derick said that $x^8 - x^6$ can be written as the difference of two squares. Which equation proves Derick's statement?

A. $x^8 - x^6 = (x^2)^6 - (x^2)^4$

B. $x^8 - x^6 = (x^2)^4 - (x^2)^3$

C. $x^8 - x^6 = (x^6)^2 - (x^4)^2$

D. $x^8 - x^6 = (x^4)^2 - (x^3)^2$

127. Which expression is equivalent to $-10x^2 - 35x + 75$?

A. $-5(2x - 5)(x + 3)$

B. $-5(2x - 3)(x + 5)$

C. $5(2x - 5)(x + 3)$

D. $5(2x - 3)(x + 5)$

128. Which expression is equivalent to $12r^2 + r - 35$?

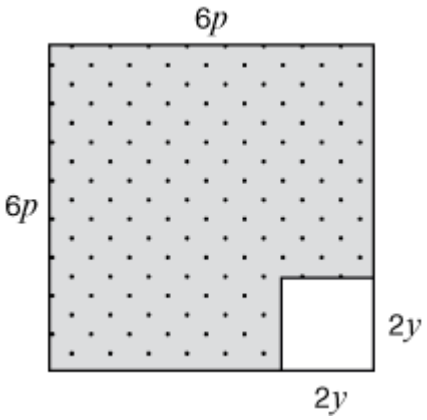
A. $(2r - 5)(6r + 7)$

B. $(2r + 5)(6r - 7)$

C. $(3r - 5)(4r + 7)$

D. $(3r + 5)(4r - 7)$

129. The floor plan of a daycare center is shown below. The arts-and-crafts area in the lower right corner is NOT carpeted. The rest of the center is carpeted.



Part A. Write an expression, in factored form, for the area of the floor that is carpeted.

Part B. What would be the area of the carpeted floor, in factored form, if the arts-and-crafts area was increased to a square with an area of $9y^2$ units?

Use words, numbers, and/or pictures to show your work.

130. Which expression is equivalent to $7r^2 - 43rs + 6s^2$?

A. $(r + 6s)(7r - s)$

B. $(r - s)(7r - 6s)$

C. $(r - 2s)(7r - 3s)$

D. $(r - 6s)(7r - s)$

131. Which expression is equivalent to the expression $(x+y)^2-(x-y)^2$?

A. 0

B. $2x^2$

C. $2y^2$

D. $4xy$

132. Which expression is equivalent to $14x^2 - 29x - 15$?

A. $(2x + 5)(7x - 3)$

B. $(2x - 5)(7x + 3)$

C. $(14x + 5)(x - 3)$

D. $(14x - 5)(x + 3)$

133. Which expression is equivalent to $12x^2 + 16x - 35$?

A. $(6x + 7)(2x - 5)$

B. $(3x + 7)(4x - 5)$

C. $(2x + 5)(6x - 7)$

D. $(4x - 5)(3x - 7)$

135. Which expression is equivalent to $x^2 - y^2$?

A. $(x - y)(x - y)$

B. $(x + y)(x - y)$

C. $(x + y)(x + y)$

D. $2(x - y)$

136. Which expression is equivalent to $a^2 + 2a - 8$?

A. $(a + 2)(a - 4)$

B. $(a + 4)(a - 2)$

C. $(a + 1)(a - 8)$

D. $(a - 1)(a + 8)$

138. Which expression is equivalent to $15x^2 + 32x - 28$?

A. $(3x + 4)(5x - 7)$

B. $(3x - 4)(5x + 7)$

C. $(3x + 2)(5x - 14)$

D. $(3x - 2)(5x + 14)$

139. Which expression is equivalent to $y^2 - 25$?

A. $(y - 5)(y - 5)$

B. $(y - 5)(y + 5)$

C. $(y - 25)(y - 1)$

D. $(y - 25)(y + 5)$

140. What are the values of a, b, and c in the equation $4(x-2)^2-7=ax^2+bx+c$?

A. $a=4;\ b=-4;\ c=-3$

B. $a=4;\ b=4;\ c=-3$

C. $a=4;\ b=16;\ c=9$

D. $a=4;\ b=-16;\ c=9$

141. Which expression is equivalent to $r^2 + r - 2$?

A. $(r + 2)(r + 1)$

B. $(r - 2)(r + 1)$

C. $(r + 2)(r - 1)$

D. $(r - 2)(r - 1)$

142. Which expression is equivalent to $4(x-2)^2+16(x-2)$?

A. $4(x^2+12)$

B. $4(x^2-4)$

C. $4(x^2+8x-4)$

D. $4(x^2+4x-12)$

149. Which of these represents one of the factors of the function $f(x)=x^2-5x+6$?

A. $(x-3)$

B. $(x-6)$

C. $(x+6)$

D. $(x+3)$

159. Which of these is a factor of the function $g(x)=3x^2+2x-1$?

A. $(3x-1)$

B. $(3x+1)$

C. $(x-1)$

D. $(x+3)$

160. What are the factors of the expression x^2-x-6?

A. $(x+3)(x+2)$

B. $(x-3)(x-2)$

C. $(x+3)(x-2)$

D. $(x-3)(x+2)$

168. Which expression can be used to find the zeros of the function $f(x)=4x^2+2x-12$?

A. $2(x+3)(x-2)$

B. $2(x+2)(2x-3)$

C. $2(x-3)(x+2)$

D. $2(2x+3)(x-2)$