

Concept and Vocabulary Check:

1. The coefficient of the monomial $-18x^4y^2$ is _____.
2. The degree of the monomial $-18x^4y^2$ is _____.
3. The coefficient of the monomial ax^ny^m is _____ and the degree is _____.
4. The degree of x^3y^2 is _____ and the degree of x^2y^7 is _____, so the degree of $x^3y^2 - 8x^2y^7$ is _____.

Practice Exercises:

In Exercises 1 and 5, evaluate each polynomial for $x = 2$ and $y = -3$.

1. $x^2 + 2xy + y^2$

5. $2x^2y - 5y + 3$

In exercise 7, determine the coefficient of each term, the degree of each term and the degree of the polynomial.

7. $x^3y^2 - 5x^2y^7 + 6y^2 - 3$

In exercises 9 - 73, perform the indicated operation.

9. $(5x^2y - 3xy) + (2x^2y - xy)$

$$13. (7x^4y^2 - 5x^2y^2 + 3xy) + (-18x^4y^2 - 6x^2y^2 - xy)$$

$$17. (3x^4y^2 + 5x^3y - 3y) - (2x^4y^2 - 3x^3y - 4y + 6x)$$

$$21. \begin{array}{r} 5x^2y^2 - 4xy^2 + 6y^2 \\ -8x^2y^2 + 5xy^2 - y^2 \\ \hline \end{array}$$

$$33. 5xy^2(10x^2 - 3y)$$

$$37. -b(a^2 - ab + b^2)$$

$$23. \begin{array}{r} 3a^2b^4 - 5ab^2 + 7ab \\ -(-5a^2b^4 - 8ab^2 - ab) \\ \hline \end{array}$$

$$41. (x - 3y)(2x + 7y)$$

25. Subtract $11x - 5y$ from the sum of $7x + 13y$ and $-26x + 19y$.

$$45. (2x + 3y)^2$$

$$29. (-8x^3y^4)(3x^2y^5)$$

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

53. $(3x + y)(3x - y)$

65. $(x + y)(x^2 + 3xy + y^2)$

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

69. $(xy + ab)(xy - ab)$

61. $(3xy^2 - 4y)(3xy^2 + 4y)$

73. $(x^2y^2 - 3)^2$

In exercise 77, write a polynomial in two variables that describes the total area of each shaded region. Express each polynomial as the sum or difference of terms.

77. See book for figure. **COPY** that figure here before completing this problem.

Applications:

91. An object that is falling or vertically projected into the air has its height, in feet, above the ground given by

$$s = -16t^2 + v_0t + s_0,$$

where s is the height, in feet, v_0 is the original velocity of the object, in feet per second, t is the time the object is in motion, in seconds, and s_0 is the height, in feet, from which the object is dropped or projected. The figure (in the book) shows that a ball is thrown straight up from a rooftop at an original velocity of 80 feet per second and from a height of 96 feet. The ball misses the rooftop on its way down and eventually strikes the ground.

How high above the ground will the ball be 6 seconds after being thrown? Describe what this means in practical terms.

Critical Thinking:

In Exercise 109, find a polynomial in two variables that describes the area of the shaded region of each figure. Write the polynomial as the sum or difference of terms.

109. See book for figure. **COPY** the figure here before completing this problem.