

**Additional Exercises 5.4**  
**Form I**  
Polynomials in Several Variables

Evaluate the polynomial for the given values of  $x$  and  $y$ .

1.  $2x + 5y - 4$ ;  $x = -2$  and  $y = -5$  1. \_\_\_\_\_

2.  $x^2 + 3y^2$ ;  $x = -1$  and  $y = 3$  2. \_\_\_\_\_

3.  $2y^2 - xy$ ;  $x = 2$  and  $y = 3$  3. \_\_\_\_\_

4.  $4x^2 - 2y^3$ ;  $x = 2$  and  $y = -1$  4. \_\_\_\_\_

5.  $x^3 + 2x^2y + 2xy^2 + y^3$ ;  $x = -2$  and  $y = -3$  5. \_\_\_\_\_

Add or subtract as indicated.

6.  $(-2x^2y^2 - 4y^4) + (6x^2y^2 + 8y^4)$  6. \_\_\_\_\_

7.  $(18x^2y^2 + 7y^4) - (-5x^4 - 7x^2y^2 + 5y^4)$  7. \_\_\_\_\_

8.  $(3x^2 - xy - y^2) + (x^2 + 2xy + 4y^2)$  8. \_\_\_\_\_

9. Add: 9. \_\_\_\_\_  
 $6x^2 - xy - y^2$   
 $2x^2 + 4xy + 8y^2$   

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10. Subtract: 10. \_\_\_\_\_  
 $(3x^5 + 5x^4y + 2y^2)$   
 $-(2x^5 - 3x^4y - 10y^2)$   

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Name \_\_\_\_\_

Date \_\_\_\_\_

Find the product.

11.  $(-3x^3y)(-2x^4y^7)$  11. \_\_\_\_\_

12.  $(6xy^4)(-2x^3y^5)$  12. \_\_\_\_\_

13.  $4ab^5(-3ab^3 + 8b^2)$  13. \_\_\_\_\_

14.  $(x + 7y)(3x + 5y)$  14. \_\_\_\_\_

15.  $(5x + 2y)(4x - 8y)$  15. \_\_\_\_\_

16.  $(2x + 7y)^2$  16. \_\_\_\_\_

17.  $(5x - 2y)^2$  17. \_\_\_\_\_

18.  $(5x - 4y)(3x - 6y + 2)$  18. \_\_\_\_\_

19.  $(2a + b)(2a - b)$  19. \_\_\_\_\_

20.  $(2x - y + 1)(2x - y - 1)$  20. \_\_\_\_\_

**Additional Exercises 5.4**  
**Form II**  
Polynomials in Several Variables

Evaluate the polynomial for the given values of  $x$  and  $y$ .

1.  $3x + 7y - 3$ ;  $x = -2$  and  $y = -5$  1. \_\_\_\_\_

2.  $-x^2 + 4y^2$ ;  $x = -1$  and  $y = 3$  2. \_\_\_\_\_

3.  $4y^2 - 3xy$ ;  $x = 2$  and  $y = 3$  3. \_\_\_\_\_

4.  $7x^2 - 4y^3$ ;  $x = 2$  and  $y = -1$  4. \_\_\_\_\_

5.  $x^3 + 3x^2y + 3xy^2 + y^3$ ;  $x = -2$  and  $y = -3$  5. \_\_\_\_\_

Add or subtract as indicated.

6.  $(-6x^2y^2 - 6y^4) + (11x^2y^2 + 16y^4)$  6. \_\_\_\_\_

7.  $(24x^2y^2 + 13y^4) - (8x^4 - 12x^2y^2 + 13y^4)$  7. \_\_\_\_\_

8.  $(4x^2 - xy - y^2) + (x^2 + 6xy + 11y^2)$  8. \_\_\_\_\_

9. Add:  
 $9x^2 - xy - y^2$   
 $x^2 + 7xy + 9y^2$   
\_\_\_\_\_ 9. \_\_\_\_\_

10. Subtract:  
 $(2x^5 + 6x^4y + 5y^2)$   
 $-(5x^5 - 4x^4y - 15y^2)$   
\_\_\_\_\_ 10. \_\_\_\_\_

Name \_\_\_\_\_

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Find the product.

11.  $(-8x^4y)(-8x^3y^6)$  11. \_\_\_\_\_

12.  $(8xy^5)(-4x^2y^3)$  12. \_\_\_\_\_

13.  $6ab^7(-6ab^4 + 11b^2)$  13. \_\_\_\_\_

14.  $(x + 11y)(4x + 6y)$  14. \_\_\_\_\_

15.  $(7x + 4y)(5x - 10y)$  15. \_\_\_\_\_

16.  $(3x + 5y)^2$  16. \_\_\_\_\_

17.  $(7x - 9y)^2$  17. \_\_\_\_\_

18.  $(7x - 12y)(6x - 12y + 1)$  18. \_\_\_\_\_

19.  $(4a + b)(4a - b)$  19. \_\_\_\_\_

20.  $(3x - y + 5)(3x - y - 5)$  20. \_\_\_\_\_

**Additional Exercises 5.4**  
**Form III**  
Polynomials in Several Variables

Evaluate the polynomial for the given values of  $x$  and  $y$ .

1.  $-6x - 4y - 2$ ;  $x = -2$  and  $y = -5$  1. \_\_\_\_\_

2.  $-x^2 + 6y^2$ ;  $x = -1$  and  $y = 3$  2. \_\_\_\_\_

3.  $5y^2 - 6xy$ ;  $x = 2$  and  $y = 3$  3. \_\_\_\_\_

4.  $9x^2 - 5y^3$ ;  $x = 2$  and  $y = -1$  4. \_\_\_\_\_

5.  $2x^3 - 3x^2y - 4xy^2 + y^3$ ;  $x = -2$  and  $y = -3$  5. \_\_\_\_\_

Add or subtract as indicated.

6.  $(8x^2y^2 - 7y^4) + (15x^2y^2 + 20y^4)$  6. \_\_\_\_\_

7.  $(36x^2y^2 + 15y^4) - (-9x^4 - 15x^2y^2 - 17y^4)$  7. \_\_\_\_\_

8.  $(8x^2 - 2xy - 6y^2) + (3x^2 + 9xy + 15y^2)$  8. \_\_\_\_\_

9. Add:  
$$\begin{array}{r} 11x^2 - 4xy - 7y^2 \\ -3x^2 + 8xy + 11y^2 \\ \hline \end{array}$$
 9. \_\_\_\_\_

10. Subtract:  
$$\begin{array}{r} (7x^5 + 9x^4y + 6y^2) \\ - (6x^5 - 3x^4y - 12y^2) \\ \hline \end{array}$$
 10. \_\_\_\_\_

Name \_\_\_\_\_

Date \_\_\_\_\_

Find the product.

11.  $(-9x^5y)(-9x^2y^7)$  11. \_\_\_\_\_

12.  $(6xy^6)(-8x^2y^3)$  12. \_\_\_\_\_

13.  $7ab^6(-6a^2b^4 + 12b^2)$  13. \_\_\_\_\_

14.  $(x + 19y)(3x + 2y)$  14. \_\_\_\_\_

15.  $(6x - 7y)(5x - 11y)$  15. \_\_\_\_\_

16.  $(4x + 8y)^2$  16. \_\_\_\_\_

17.  $(8x - 9y)^2$  17. \_\_\_\_\_

18.  $(4x - 11y)(5x - 13y + 7)$  18. \_\_\_\_\_

19.  $(5a + 2b)(5a - 2b)$  19. \_\_\_\_\_

20.  $(4x - 2y + 6)(4x - 2y - 6)$  20. \_\_\_\_\_