

## 1.6 EXERCISES

### PRACTICE

Factor each polynomial by factoring out the greatest common factor. See Example 1.

1.  $4m^2n + 16m^3 + 7m$

2.  $3a^2b + 3a^3b - 9a^2b^2$

3.  $5(a - b^2) + (a - b^2)$

4.  $3x^3y - 9x^4y + 12x^3y^2$

5.  $2x^6 - 14x^3 + 8x$

6.  $27x^7y + 9x^6y - 9x^4yz$

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

8.  $6xy^3 + 9y^3 - 12xy^4$

9.  $12y^6 - 8y^2 - 16y^5$

10.  $(2x + y^2)^4 - (2x + y^2)^6$

Factor each polynomial by grouping. See Example 2.

11.  $a^3 + ab - a^2b - b^2$

12.  $ax - 2bx - 2ay + 4by$

13.  $z + z^2 + z^3 + z^4$

14.  $x^2 + 3xy + 3y + x$

15.  $nx^2 - 2y - 2x^2 + ny$

16.  $2ac - 3bd + bc - 6ad$

17.  $ax - 5bx + 5ay - 25by$

18.  $3ac - 5bd + bc - 15ad$

Use the special factoring patterns to factor the following binomials. See Example 3.

19.  $4x^2 - 121$

20.  $64z^3 + 216$

21.  $49a^2 - 144b^2$

22.  $x^3 - 27y^3$

23.  $25x^4y^2 - 9$

24.  $27a^9 + 8b^{12}$

25.  $x^3 - 1000y^3$

26.  $64x^6 - 125y^3z^9$

27.  $m^6 + 125n^9$

28.  $49a^6 - 9b^2c^4$

29.  $27x^6 - 8y^{12}z^3$

30.  $(3x - 6)^2 - (y - 2x)^2$

31.  $16z^2y^4 - 9x^8$

32.  $512x^6 + 729y^3$

33.  $343y^9 - 27x^3z^6$

34.  $(2x + y^2)^2 - (y^2 - 3)^2$

Factor the following trinomials. See Examples 4, 5, and 6.

35.  $x^2 + 2x - 15$

36.  $x^2 + 6x + 9$

37.  $x^2 - 2x + 1$

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

39.  $x^2 - 4x + 4$

40.  $x^2 + 5x + 4$

41.  $y^2 + 14y + 49$

42.  $x^2 - 3x - 18$

43.  $x^2 + 13x + 22$

44.  $y^2 + y - 42$

45.  $y^2 - 9y + 8$

46.  $6x^2 + 5x - 6$

47.  $5a^2 - 37a - 24$

48.  $25y^2 + 10y + 1$

49.  $5x^2 + 27x - 18$

50.  $6y^2 - 13y - 8$

51.  $16y^2 - 25y + 9$

52.  $10m^2 + 29m + 10$

53.  $8a^2 - 2a - 3$

54.  $20y^2 + 21y - 5$

55.  $12y^2 - 19y + 5$

56.  $10y^2 - 11y - 6$

Factor the following algebraic expressions. See Example 7.

57.  $(2x-1)^{-\frac{3}{2}} + (2x-1)^{-\frac{1}{2}}$

58.  $2x^{-2} + 3x^{-1}$

59.  $7a^{-1} - 2a^{-3}b$

60.  $(3z+2)^{\frac{5}{3}} - (3z+2)^{\frac{2}{3}}$

61.  $10y^{-2} - 2y^{-5}x$

62.  $4y^{-3} + 12y^{-4}$

63.  $(5x+7)^{\frac{7}{3}} - (5x+7)^{\frac{4}{3}}$

64.  $(8x+6)^{-\frac{7}{2}} - (8x+6)^{-\frac{1}{2}}$

65.  $7y^{-1} + 5y^{-4}$

66.  $5x^{-4} - 4x^{-5}y$