APPLICATIONS

MONOMIAL FACTORS Find the greatest common factor of the terms in the polynomial.

18. $14x^2 + 8x + 72$

19. $3x^4 - 12x^3$

20. $7x + 28x^2 - 35x^3$

21. $24x^4 - 6x$

22. $39x^5 + 13x^3 - 78x^2$

23. $145x^9 - 17$

24. $6x^6 - 3x^4 - 9x^2$

25. $72x^9 + 15x^6 + 9x^3$

26. $6x^4 - 18x^3 + 15x^2$

MATCHING Match the polynomial with its factorization.

27. $3x^2 + 11x + 6$

28. $x^3 - 4x^2 + 4x - 16$

29. $125x^3 - 216$

30. $2x^7 - 32x^3$

31. $2x^5 + 4x^4 - 4x^3 - 8x^2$

32. $2x^3 - 32x$

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

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

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

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

E. $2x^2(x^2 - 2)(x + 2)$

F. $(5x - 6)(25x^2 + 30x + 36)$

Polynomials and Polynomial Functions

SUM OR DIFFERENCE OF CUBES Factor the polynomial.

33. $x^3 - 8$

34. $x^3 + 64$

35. $216x^3 + 1$

36. $125x^3 - 8$

37. $1000x^3 + 27$

38. $27x^3 + 216$

39. $32x^3 - 4$

40. $2x^3 + 54$

GROUPING Factor the polynomial by grouping.

41. $x^3 + x^2 + x + 1$

42. $10x^3 + 20x^2 + x + 2$

43. $x^3 + 3x^2 + 10x + 30$

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

45. $2x^3 - 5x^2 + 18x - 45$

46. $-2x^3 - 4x^2 - 3x - 6$

47. $3x^3 - 6x^2 + x - 2$

48. $2x^3 - x^2 + 2x - 1$

49. $3x^3 - 2x^2 - 9x + 6$

QUADRATIC FORM Factor the polynomial.

50. $16x^4 - 1$

51. $x^4 + 3x^2 + 2$

52. $x^4 - 81$

53. $81x^4 - 256$

54. $4x^4 - 5x^2 - 9$

55. $x^4 + 10x^2 + 16$

56. $81 - 16x^4$

57. $32x^6 - 2x^2$

58. $6x^5 - 51x^3 - 27x$

CHOOSING A METHOD Factor using any method.

59. $18x^3 - 2x^2 + 27x - 3$

60. $6x^3 + 21x^2 + 15x$

61. $4x^4 + 39x^2 - 10$

62. $8x^3 - 12x^2 - 2x + 3$

63. $8x^3 - 64$

64. $3x^4 - 300x^2$

65. $3x^4 - 24x$

66. $5x^4 + 31x^2 + 6$

67. $3x^4 + 9x^3 + x^2 + 3x$

SOLVING EQUATIONS Find the real-number solutions of the equation.

68. $x^3 - 3x^2 = 0$

69. $2x^3 - 6x^2 = 0$

70. $3x^4 + 15x^2 - 72 = 0$

71. $x^3 + 27 = 0$

72. $x^3 + 2x^2 - x = 2$

73. $x^4 + 7x^3 - 8x - 56 = 0$

74. $2x^4 - 26x^2 + 72 = 0$

75. $3x^7 - 243x^3 = 0$

76. $x^3 + 3x^2 - 2x - 6 = 0$

77. $8x^3 - 1 = 0$

78. $x^3 + 8x^2 = -16x$

79. $x^3 - 5x^2 + 5x - 25 = 0$

80. $3x^4 + 3x^3 = 6x^2 + 6x$

81. $x^4 + x^3 - x = 1$

82. $4x^4 + 20x^2 = -25$

83. $-2x^6 = 16$

84. $3x^7 = 81x^4$

85. $2x^5 - 12x^3 = -16x$