

■ Write each expression as a polynomial and simplify. See Example 5.

45. $(x - 1)(x^2 + x + 1)$ 46. $(x + 2)(x^2 - 2x + 4)$
 47. $(2x + 1)(4x^2 - 2x + 1)$ 48. $(3x - 1)(9x^2 + 3x + 1)$
 49. $(3a - 2b)(9a^2 + 6ab + 4b^2)$ 50. $(2a + 3b)(4a^2 - 6ab + 9b^2)$

■ Factor completely. See Example 6.

51. $x^3 + 27$ 52. $y^3 - 1$ 53. $(2x)^3 - y^3$
 54. $y^3 + (3x)^3$ 55. $a^3 - 8b^3$ 56. $27a^3 + b^3$
 57. $x^3y^3 - 1$ 58. $8 + x^3y^3$ 59. $27a^3 + 64b^3$
 60. $8a^3 - 125b^3$ 61. $125a^3b^3 - 1$ 62. $64a^3b^3 + 1$
 63. $x^3 + (x - y)^3$ 64. $(x + y)^3 - z^3$ 65. $(x + 2y)^3 - 8x^3$
 66. $x^3 + (x - 2y)^3$ 67. $(x + 1)^3 - (x - 1)^3$ 68. $(2y - 1)^3 + (y - 1)^3$

■ See Example 7.

69. $y^4 - 9$ 70. $y^4 - 49$ 71. $a^4 + 3a^2 + 2$ 72. $a^4 - 5a^2 + 6$
 73. $3x^4 + 7x^2 + 2$ 74. $4x^4 - 11x^2 - 3$ 75. $x^4 - 16$ 76. $x^4 - 81$
 77. $x^6 + 3x^3 - 4$ 78. $x^6 - 6x^3 - 27$ 79. $u^8 - 5u^4 + 4$ 80. $u^8 - 13u^4 + 36$
 81. $4x^2y^3 - 36y^3$ 82. $x^3 - 4x^3y^2$ 83. $x^4y^2 - x^2y^2$ 84. $x^3y - xy^3$
 85. $24a^6b^2 - 3b^2$ 86. $2a^3 - 54a^3b^9$ 87. $9a^3b^6 + 3a^3b^4 - 6a^3b^2$
 88. $9a^3b^6 + 3a^3b^4 - 6a^3b^2$ 89. $9a^2x^8 + 9a^4x^6 - 18a^6x^4$ 90. $6ax^5 + 9a^3x^3 - 6a^5x$
 91. $6x^9 - 22x^6 - 8x^3$ 92. $4x^8 - 30x^5 - 54x^2$
 93. $x^6 - y^6$ 94. $x^9 - y^9$

■ Solve. See Example 8.

95. Jack invests \$500 in an account bearing interest rate r , compounded annually.
- Write expressions for the amount of money in Jack's account after 2 years, after 3 years, and after 4 years.
 - Write the expressions found in (a) as polynomials.
 - Using either the expressions found in (a) or the polynomials found in (b), find the amount in Jack's account after 2 years, after 3 years, and after 4 years at an interest rate of 8%.
96. A small company borrows \$800 for start-up costs and agrees to repay the loan at interest rate r , compounded annually.
- Write expressions for the amount the company will owe if it repays the loan after 2 years, after 3 years, or after 4 years.
 - Write the expressions found in (a) as polynomials.
 - Using either the expressions found in (a) or the polynomials found in (b), find the amount the company owes after 2 years, after 3 years, or after 4 years at an interest rate of 12%.