Q7. Find 0.3% of 2000.

Q8. Sketch the graph of a decreasing exponential function.

Q9. Write the general equation of a quadratic function.

Q10. Sketch the graph of $y = \dfrac{1}{(x-2)}$.

Q7. 6
Q8. See Additional Answers.
Q9. $y = ax^2 + bx + c$
Q10. See Additional Answers.

Work the following problems.

↱ or Rational Root Theorem

In Problems 1 through 22, use the Factor Theorem either to factor the polynomial completely or to prove that it has *no* linear factors with integer coefficients.

1. $x^3 + 3x^2 - 18x - 40$
2. $x^3 + 9x^2 + 24x + 20$
3. $x^3 - 10x^2 - 17x + 66$
4. $x^3 + 3x^2 - 6x - 8$
5. $x^3 - x^2 - 5x + 2$
6. $x^3 - 2x^2 - 14x + 3$
7. $x^3 + 3x^2 - 7x + 2$
8. $x^3 + 2x^2 - 9x + 3$
9. $x^4 + 2x^3 - 13x^2 - 14x + 24$
10. $x^4 + 4x^3 - 7x^2 - 34x - 24$
11. $x^4 - 2x^3 - 3x^2 + 4x + 4$
12. $x^4 - 7x^3 + 18x^2 - 20x + 8$
13. $x^5 + 5x^4 + 10x^3 + 10x^2 + 5x + 1$
14. $x^6 - 6x^5 + 15x^4 - 20x^3 + 15x^2 - 6x + 1$
15. $2x^3 + 5x^2 + x - 2$
16. $3x^3 - 2x^2 - 7x - 2$
17. $2x^3 + 3x^2 - x - 1$
18. $3x^3 + 5x^2 - 5x + 1$
19. $12x^3 + 4x^2 - 3x - 1$
20. $18x^3 + 9x^2 - 2x - 1$
21. $12x^3 - 20x^2 - 37x + 30$
22. $18x^3 - 9x^2 - 38x + 24$

For Problems 23 through 46, use the pattern for factoring the sum or difference of like, odd powers, and any other techniques you may need, to factor the polynomial completely.

23. $x^7 + y^7$
24. $x^7 - y^7$
25. $x^{11} - 1$
26. $x^{11} + 1$
27. $x^5 + 32$
28. $x^5 - 32$
29. $a^{13} - b^{13}$
30. $a^{13} + b^{13}$
31. $a^5 + 32b^{10}$

1. $(x + 2)(x - 4)(x + 5)$
2. $(x + 2)^2(x + 5)$
3. $(x - 2)(x + 3)(x - 11)$
4. $(x + 1)(x - 2)(x + 4)$
5. $(x + 2)(x^2 - 3x + 1)$
6. $(x + 3)(x^2 - 5x + 1)$
7. Prime.
8. Prime.
9. $(x - 1)(x + 2)(x - 3)(x + 4)$
10. $(x + 1)(x + 2)(x - 3)(x + 4)$
11. $(x + 1)^2(x - 2)^2$
12. $(x - 1)(x - 2)^3$
13. $(x + 1)^5$
14. $(x - 1)^6$
15. $(2x - 1)(x + 2)(x + 1)$
16. $(3x + 1)(x - 2)(x + 1)$
17. $(2x + 1)(x^2 + x - 1)$
18. $(3x - 1)(x^2 + 2x - 1)$
19. $(2x + 1)(3x + 1)(2x - 1)$
20. $(2x + 1)(3x - 1)(3x + 1)$
21. $(2x + 3)(2x - 5)(3x - 2)$
22. $(3x - 2)(2x + 3)(3x - 4)$
23. $(x + y)(x^6 - x^5y + x^4y^2 - x^3y^3 + x^2y^4 - xy^5 + y^6)$
24. $(x - y)(x^6 + x^5y + x^4y^2 + x^3y^3 + x^2y^4 + xy^5 + y^6)$
25. $(x - 1)(x^{10} + x^9 + x^8 + x^7 + x^6 + x^5 + x^4 + x^3 + x^2 + x + 1)$
26. $(x + 1)(x^{10} - x^9 + x^8 - x^7 + x^6 - x^5 + x^4 - x^3 + x^2 - x + 1)$
27. $(x + 2)(x^4 - 2x^3 + 4x^2 - 8x + 16)$
28. $(x - 2)(x^4 + 2x^3 + 4x^2 + 8x + 16)$
29. $(a - b)(a^{12} + a^{11}b + a^{10}b^2 + a^9b^3 + a^8b^4 + a^7b^5 + a^6b^6 + a^5b^7 + a^4b^8 + a^3b^9 + a^2b^{10} + ab^{11} + b^{12})$
30. $(a + b)(a^{12} - a^{11}b + a^{10}b^2 - a^9b^3 + a^8b^4 - a^7b^5 + a^6b^6 - a^5b^7 + a^4b^8 - a^3b^9 + a^2b^{10} - ab^{11} + b^{12})$
31. $(a + 2b^2)(a^4 - 2a^3b^2 + 4a^2b^4 - 8ab^6 + 16b^8)$