5.5 Practice A

In Exercises 1–6, solve the equation.

1. \( q^3 - q^2 - 30q = 0 \)
2. \( k^3 + 6k^2 + 9k = 0 \)
3. \( 3y^4 - 6y^3 = -3y^2 \)
4. \( n^3 + 2n^2 - 9n - 18 = 0 \)
5. \( 3p^3 = 21p \)
6. \( 8u^6 = 16u^4 \)

In Exercises 7–10, find the zeros of the function. Then sketch a graph of the function.

7. \( f(x) = x^4 + x^3 - 12x^2 \)
8. \( g(x) = x^4 - 8x^2 + 16 \)
9. \( h(x) = x^5 - 2x^4 - 15x^3 \)
10. \( f(x) = -3x^3 - 15x^2 - 12x \)

11. According to the Rational Root Theorem, which is not a possible solution of the equation \( 3x^4 - 6x^3 + 2x + 4 = 0 \)?
   A. 4  B. \( \frac{1}{3} \)  C. \(-3\)  D. \( \frac{-2}{3} \)

12. Describe and correct the error in listing the possible rational zeros of the function.

   \( f(x) = x^3 + 3x^2 - 8x - 18 \)
   Possible zeros: \( \pm 2, \pm 3, \pm 6, \pm 9 \)

In Exercises 13 and 14, find all the real solutions of the equation.

13. \( x^4 - 8x^2 - 9 = 0 \)
14. \( x^3 + 2x^2 - 5x - 6 = 0 \)
5.5 Practice B

In Exercises 1–6, solve the equation.

1. $4x^4 + 12x^3 + 9x^2 = 0$
2. $6h^5 = 12h^3$
3. $16q^4 - 8q^2 + 1 = 0$
4. $w^4 + 81 = 18w^2$
5. $p^3 - 25p = 50 - 2p^2$
6. $y^3 - 8y^2 = 9y - 72$

In Exercises 7–10, find the zeros of the function. Then sketch a graph of the function.

7. $f(x) = -5x^4 + 20x^3 + 60x^2$
8. $g(x) = -x^3 - x^2 + 30x$
9. $h(x) = x^3 + x^2 - 4x - 4$
10. $f(x) = x^3 - 4x^2 - 9x + 36$

11. According to the Rational Root Theorem, which is not a possible zero of the function $f(x) = 24x^4 - 16x^3 + 21x - 27$?
   A. $\frac{-3}{8}$
   B. $-2$
   C. $-\frac{1}{3}$
   D. $-\frac{9}{4}$

12. Describe and correct the error in listing the possible rational zeros of the function.

   $\times$ $f(x) = 2x^3 + 5x^2 - 2x - 6$
   Possible zeros: $\pm 1, \pm 2, \pm 3, \pm 6$

In Exercises 13 and 14, find all the real solutions of the equation.

13. $2x^3 - 3x^2 + 18x - 27 = 0$
14. $x^3 - 5x^2 - 2x + 24 = 0$

15. The sidewalk hazard marker is shaped like a pyramid, with a height 2 centimeters greater than the length of each side of its square base. The volume of the marker is 297 cubic centimeters. What are the dimensions of the sidewalk hazard marker?