Honors Algebra II   Name: _____

Study Guide Unit 3   Date: _____ Per: ____

Polynomial Functions

Factor completely.

   1. $8a^3 + 1$ 2. $a^4 - 81b^4$

3. $18x^3 - 32x$ 4. $x^3 + 2x^2 + 3x + 6$

5. $x^4 - 6x^2 + 8$

Determine the number of roots in the polynomial function.

6. $f(x) = 7x^7 - 9x^5 + 3x^4 + 12x + 1$

7. $f(x) = x^4 + x^3 + 2x^2 + 4x - 8$

8. $f(x) = -16x^3 - 8x^2 + 11x + 12$

9 – 11. Determine the number of possible positive and negative roots in problems 6 – 8.

Find the possible rational roots.

12. $5x^5 - 7x^3 - 9 = 0$

13. $x^2 - 5x + 12 = 0$

Find the remaining roots of the polynomials, given one factor.

14. $x^3 + 5x^2 + 3x - 9 = 0;\ (x - 1)$

15. $x^4 + 5x^2 - 36 = 0; (x + 2)$

Find the solutions of the polynomial equations.

16. $x^3 - 2x^2 + 16x - 32 = 0$

17. $3x^3 - 7x^2 + 2x = 0$

Write a polynomial equation of least degree with integral coefficients that has the roots given.
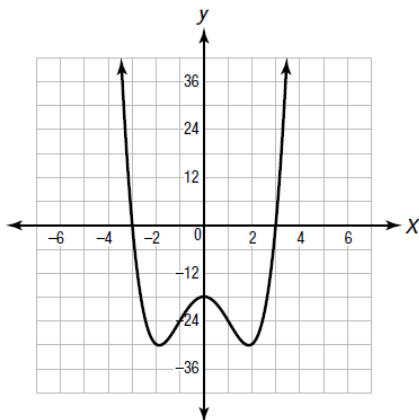
18. 0, 1, 4, -5

19. $2, \pm 2i$

Describe the end behavior of the polynomial functions.

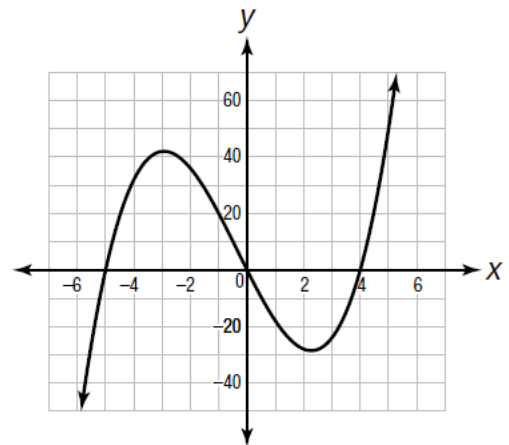20. $f(x) = 3x^4 + 7x^3 + x^2 + 4x - 18$

21. $f(x) = -6x^3 - x^2 + 1x + 2$

Is the degree of the polynomial graphed below even or odd and is the leading coefficient positive or negative?
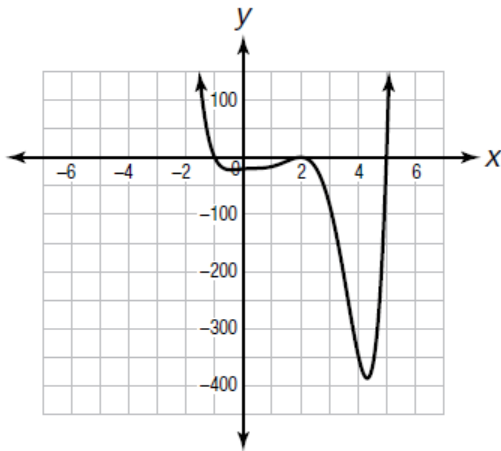
22.

23.

Determine the zero with multiplicity.

24.

25. Which of the following is a factor of the polynomial $2x^3 - x^2 - 13x - 6 = 0$?

a. $(x - 3)$ b. $(x - 2)$ c. $(x + 1)$ d. $(x + 4)$