Advanced Algebra - Chapter 6 Review

Name_____ Period_____

1. List all possible rational zeros of the function
    $f(x) = 4x^3 + 2x^2 + 16x + 8$. Do **not** find the zeros.

    1. _____

2. Solve the following equation, giving exact
    answers: $x^3 - x^2 - 9x + 9 = 0$. **No Calc.**

    2. _____

3. Solve the following equation, giving exact
    answers: $x^3 - 2x^2 - 9x = -18$.   **No Calc.**

    3. _____

4. Solve the following equation, giving exact
    answers: $x^4 + x^2 = 2$.   **No Calc.**

    4. _____

5. Solve the following equation, giving exact
    answers: $x^2 - 12x = 28$.   **No Calc.**

    5. _____

6. Solve the following equation, giving exact answers: $(x - 2)^2 + 64 = 72$. **No Calc.**

6. _____

7. Find the zeros and multiplicity of zeros of the function: $f(x) = 2x^5 - 12x^4 + 18x^3$. **(No calc)**

7. _____

8. Solve the following equation, giving exact answers: $x^4 + x^3 + 2x^2 + 4x = 8$. **YES Calc.**

8. _____

9. Write the following polynomial in standard form. Also classify it by number of terms and degree. Polynomial: $(x^2 + 2x + 3) - (x^2 - 5)$

9. Standard
    form: _____

    Name by degree: _____

    Name by
    number of terms: _____

10. Write the following polynomial in standard form. Also classify it by number of terms and degree. Polynomial: $(6x^3 + 3x^2 - 5x - 1) - (7x^3 - 5x - 6)$

10. Standard
    form: _____

    Name by degree: _____

    Name by
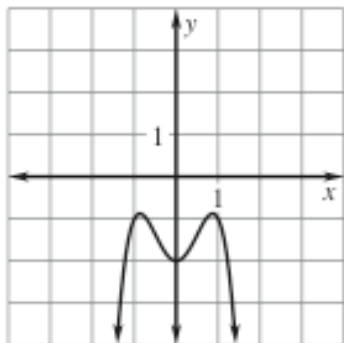   number of terms: _____

11. Write the following polynomial in standard form. Also classify it by number of terms and degree. Polynomial: $(2x + 3)(4x^2 - 10)$
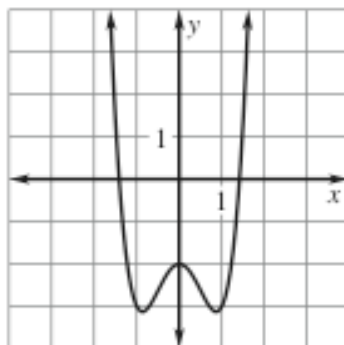
11. Standard
    form: _____

    Name by degree: _____

    Name by
    number of terms: _____

12. Use the graph below to **approximate** any relative minimums and maximums.

12. Max(s): _____

Min(s): _____

13. Use the graph below to **approximate** any relative minimums and maximums.

13. Max(s): _____

Min(s): _____

14. Divide $(x^4 + 9x^3 - 4x - 17) \div (x + 5)$. **No Calc**

14. _____

15. Divide $(12x^3 + 19x^2 + 8x + 6) \div (4x + 1)$. **No Calc**

15. _____

16. Three of the roots of a polynomial are -1, 5, –4*i.* 16. Roots: _____
    What are all of the **_roots_** of this polynomial?
    Write the function in factored form. **No Calc.** Factored Form:

    _____

17. Two of the roots of a polynomial are $-\sqrt{3}$ and 7*i.* 17. Factors: _____
    What are all of the **_factors_** of this polynomial?
    Explain. **No Calc.** _____

    Explanation:

    _____

    _____

    _____

    _____

    _____

18. Describe the end behavior of the function 18. $\lim\limits_{x \to -\infty} f(x) =$ _____

    $f(x) = -2x^5 - 8x^4 + 10x^3$ by filling in the blanks
    at right. **No Calc.** $\lim\limits_{x \to +\infty} f(x) =$ _____

19. Write a possible function in factored form 19. _____
    for the graph shown below. **No Calc.**
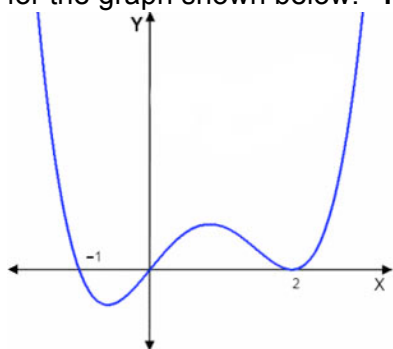
20. Describe the end behavior of the graph in #19. **No Calc** 20. $\lim\limits_{x \to -\infty} f(x) =$ _____

    $\lim\limits_{x \to +\infty} f(x) =$ _____

21. Determine if $(x - 4)$ is a factor of the function $f(x) = x^4 - 3x^2 + 5x - 8$. How does this method shown if this or is not a factor? **No Calc.**

21. _____

_____

_____

22. The average amount of tangarines (t in pounds) eaten per person each year in the United States from 2001 to 2006 can be modeled by $t = 0.298y^3 - 1.73y^2 + 2.05y + 4.45$ where y is the number of years since 2001. **Using your graphing calculator:**

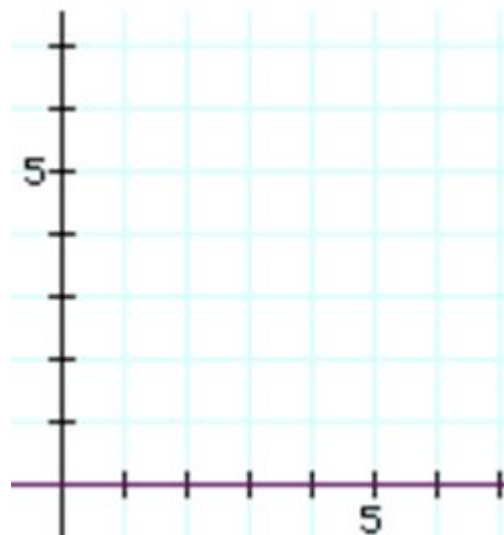a. Graph the function and identify the relative minimum and relative maximum where $0 \le y \le 4$.

Relative minimum: _____

Relative maximum: _____

b. What is the real-life meaning of the relative minimum?

_____

_____

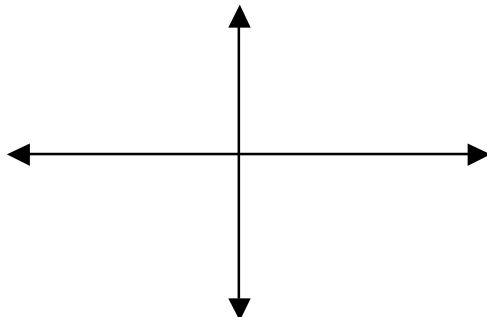c. What is the real-life meaning of the relative maximum?

_____

_____

a.

23. **Use your graphing calculator** to sketch a graph on the interval $-5 \leq x \leq 3$ and find the coordinates of the zero(s), relative maximum(s), and relative minimums(s) of the function listed below. Also identify the end behavior of the graph of the function.

Function: $f(x) = 0.25x^3 + 0.755x^2 - 1.06x - 1.17$

a. Sketch:

b. Zero(s) of the function: _____

c. Relative minimum(s): _____

d. Relative maximum(s): _____

e. End behavior: $\lim_{x \to -\infty} f(x) = $ _____

$\lim_{x \to +\infty} f(x) = $ _____