DESCARTES' RULE OF SIGNS

<u>Directions</u>: State the number of possible positive and negative real zeros for each function.

1.) $f(x) = 3x^4 + 20x - 32$

# of possible positive real zeros: _____

# of possible negative real zeros: _____

2.) $f(x) = 5x^4 - 42x^2 + 49$

# of possible positive real zeros: _____

# of possible negative real zeros: _____

3.) $f(x) = 4x^3 - 12x^2 - 5x + 1$

# of possible positive real zeros: _____

# of possible negative real zeros: _____

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

# of possible positive real zeros: _____

# of possible negative real zeros: _____

5.) $f(x) = 2x^4 + 3x^2 - 54$

# of possible positive real zeros: _____

# of possible negative real zeros: _____

6.) $f(x) = x^6 - 64$

# of possible positive real zeros: _____

# of possible negative real zeros: _____

7.) $f(x) = 9x^6 - 3x^5 + 33x^4 - 11x^3 + 18x^2 - 6x$

# of possible positive real zeros: _____

# of possible negative real zeros: _____

8.) $f(x) = 64x^6 - 1$

# of possible positive real zeros: _____

# of possible negative real zeros: _____

9.) $f(x) = 2x^5 + 4x^4 + 9x^3 + 18x^2 - 35x - 70$

# of possible positive real zeros: _____

# of possible negative real zeros: _____

10.) $f(x) = 6x^5 - 4x^4 - 63x^3 + 42x^2 + 147x - 98$

# of possible positive real zeros: _____

# of possible negative real zeros: _____

11.) $f(x) = 16x^6 - 32x^4 - 25x^2 + 50$

12.) $f(x) = x^7 - 64x$

# of possible positive real zeros: _____

# of possible negative real zeros: _____

# of possible positive real zeros: _____

# of possible negative real zeros: _____

13.) $f(x) = 8x^6 + 9x^3 + 1$

14.) $f(x) = 27x^6 + 26x^3 - 1$

# of possible positive real zeros: _____

# of possible negative real zeros: _____

# of possible positive real zeros: _____

# of possible negative real zeros: _____

Directions: Use your knowledge of properties of polynomial functions to determine all zeros WITHOUT a calculator.

15.) $f(x) = -4x^3 + 15x^2 - 8x - 3$

a.) Determine the end behavior of $f(x)$.

$x \to -\infty$ $f(x) \to$ _____ $x \to \infty$ $f(x) \to$ _____

b.) Determine the possible number of turning points of $f(x)$.

# of possible turning points: _____

c.) Use Descartes' Rule of Signs to determine the possible number of positive and negative zeros of $f(x)$.

# of possible positive real zeros: _____

# of possible negative real zeros: _____

d.) Use synthetic division to test for rational zeros.

FACTORS: _____

ZEROS: _____

x-intercept(s): _____