

Name: _____ Date: _____ Per: _____

UNIT 5 Review – Part 5.1: Graphing Polynomial Functions and Real Zeros

Given the following polynomial functions, get them into standard form, then find the following unknowns.

1.) $y = 13 - 2x + 4x^5 + 2x - 2$	2.) $y = 2x^2(-3x^2 + 2x) - 3(x - 7) - 4x^3$
Standard Form: _____	Standard Form: _____
End Behavior: _____ / _____	End Behavior: _____ / _____

Factor each polynomial function and then **find all the zeros**. Make sure to state multiplicity of multiple zeros.

3.) $f(x) = x^3 + 2x^2 - 49x - 98$	4.) $g(x) = -4x^4 - 12x^3 + 40x^2$
5.) $h(x) = x^5 - 81x^3$	6.) $f(x) = 6x^3 + 7x^2 - 5x$

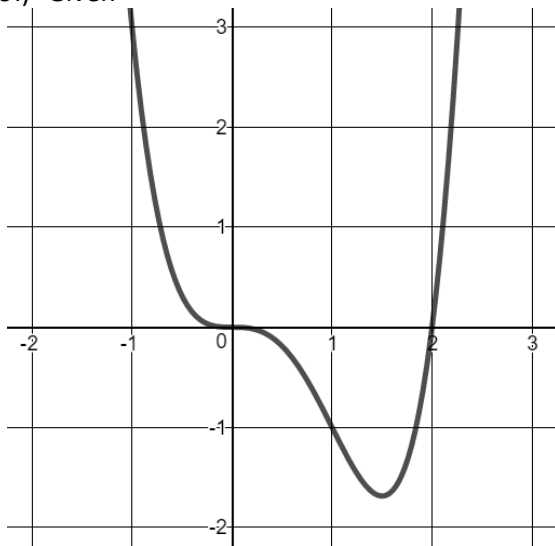
Write a polynomial function in **standard form** with the given zeros.

7.) $x = 0$ (mult. 3) and 6 (mult. 2)

8.) $x = 5, -3,$ and $\frac{1}{4}$

Given the following graphs of polynomial functions, find the following unknowns.

9.) Given



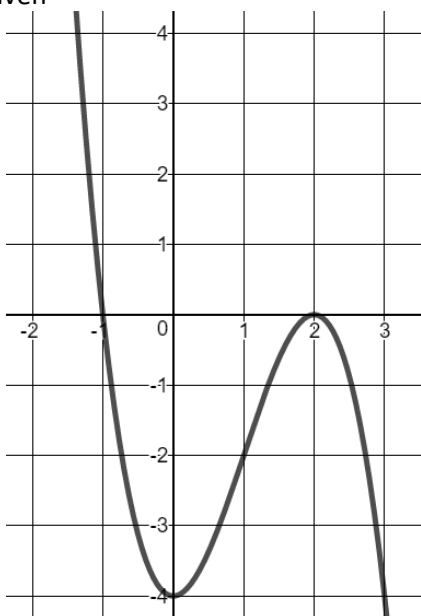
Degree is EVEN or ODD (circle one)

Sign of the Leading Coefficient is _____

Real Zeros are at: _____

Do any zeros have multiplicity? If so, which ones and how can you tell?

10.) Given



Degree is EVEN or ODD (circle one)

Sign of the Leading Coefficient is _____

Real Zeros are at: _____

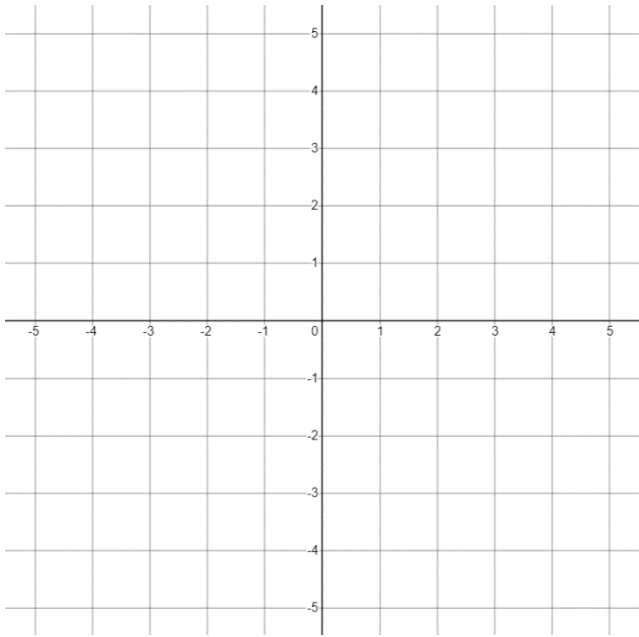
Do any zeros have multiplicity? If so, which ones and how can you tell?

Find the zeros of each function. State multiplicity of multiple zeros. Then sketch a graph the function.

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

Zeros are at: _____

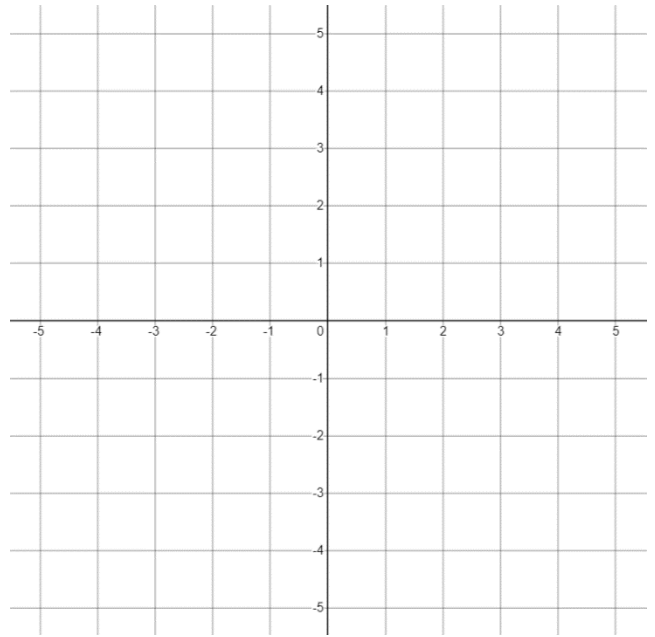
End Behavior: _____ / _____



12.) $f(x) = x^3(x + 3)^2$

Zeros are at: _____

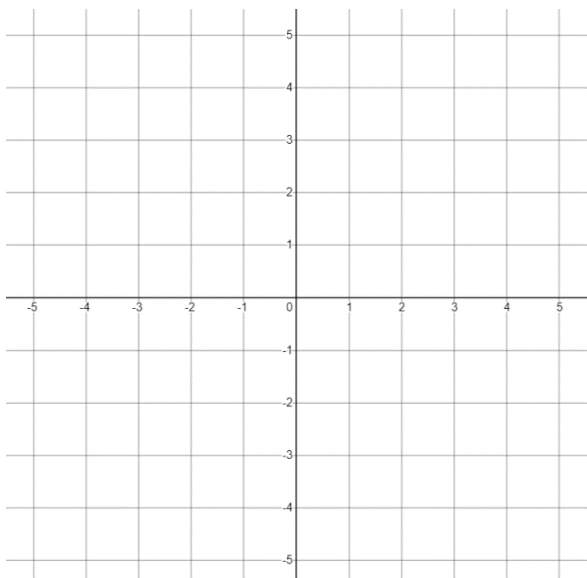
End Behavior: _____ / _____



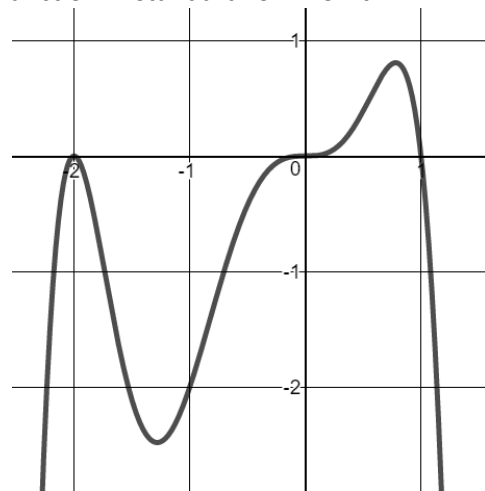
13.) $f(x) = -2x^4 - 2x^3 + 12x^2$

Zeros are at: _____

End Behavior: _____ / _____



14.) Given the following graph, write a polynomial function in standard form for it.



Function in Standard Form:

Part 5.2 – Solving Polynomial Equations with Real/Imaginary Zeros –

Directions: Complete the following problems and any zeros should be in simplified form. NO DECIMAL ANSWERS!!! Also, state multiplicity of any multiple zeros. Circle final answers.

1.) Find all the real and/or imaginary zeros.

$$24x^2 - 18x = 0$$

2.) Find all the real and/or imaginary zeros.

$$3x^2 - 8 = -2x$$

3.) Find all the real and/or imaginary zeros.

$$x^6 + x^4 = 20x^2$$

4.) Find all the real and/or imaginary zeros.

$$100x^3 + 200x^2 - 18 = 9x$$

5.) Find all the real and/or imaginary zeros.

$$2x^4 - 432x = 0$$

6.) Given the following polynomial function. Determine if $(x + 1)$ is a factor of it.

$$f(x) = x^3 + 6x^2 - 2x - 11$$

Is $(x + 1)$ a factor? YES / NO (*circle one*). Explain here below how you know:

7.) Given: $x^3 - 2x^2 + x - 12 = 0$

a.) Use the rational zero theorem to list **all possible rational zeros**.

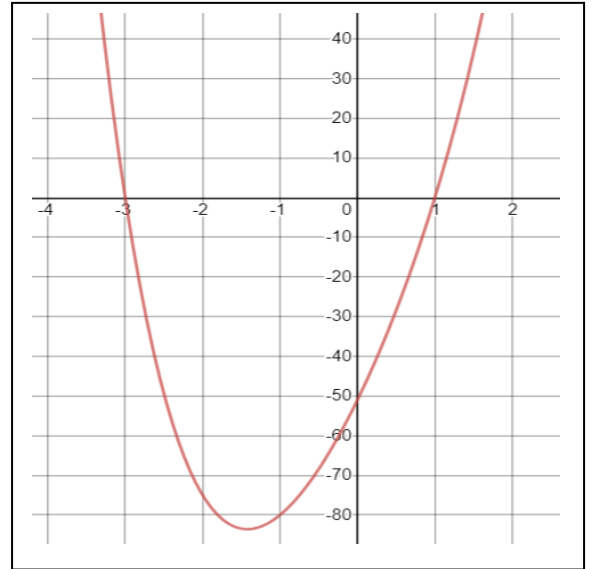
b.) Using **synthetic division** and the numbers from above find a real zero, then **find all the zeros**.

8.) Given the following zeros, write the polynomial function in **standard form**.

$$7i \text{ and } -i\sqrt{2}$$

9.) Find all the real and/or imaginary zeros. Given this graph of the function below.

$$x^4 + 10x^2 = 51 - 40x$$



10.) Given the following zeros, write the polynomial function in **standard form**.

$$0 \text{ (mult. 3)} \quad \text{and} \quad 4 + 5i \quad \text{and} \quad \sqrt{3}$$