Algebra 3-4 Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per:\_\_\_\_\_

Ch 9 Day 1 Exploring Polynomials Notes March 13/14, 2017

**Define the following:**

* Polynomial:
* Degree:
* Zero:

|  |  |  |  |
| --- | --- | --- | --- |
| **1st degree** | **2nd degree** | **3rd degree** | **4th degree** |

Draw an example of each of the following:

|  |  |  |
| --- | --- | --- |
| A 2nd degree polynomial with no zeros | A 2nd degree polynomial with 1 zero | A 3rd degree polynomial with 2 zeros |
| A 3rd degree polynomial with 1 zero | A 3rd degree polynomial with no zeros | A 4th degree polynomial with 3 zeros |
| A 4th degree polynomial with 2 zeros | A 4th degree polynomial with 1 zero | A 4th degree polynomial with no zeros |

What is the degree of the function f(x) = 3x2 – 4x + 5

Make a conjecture stating how many zeros are possible for a degree 3 polynomial.

Consider the function .

**a.** What is the degree of *f*? \_\_\_\_\_\_\_\_\_\_

**b.** What is the leading term? \_\_\_\_\_\_\_\_\_\_\_

**c.** How many zeros does it have and what are they? \_\_\_\_\_\_\_\_\_\_\_\_

**d.** Sketch a rough graph of the function and feel free to use a graphing
calculator to guide you.

Draw a rough sketch of a degree 4 polynomial that has exactly 3 zeros.



**1.** Consider the function .

Degree:

Leading Term:

a. Draw a graph of *y1* in the window

xmin= -10, xmax= 10, ymin= -30, ymax= 50.

b. Where are the *x* intercepts?

Degree:

Leading Term:



**2.** Consider the function 

a. Draw a graph of *y2* in the window

xmin= -10, xmax= 10, ymin= -300, ymax= 300.

b. Where are the *x* intercepts?

c. How are the graphs of  and

 similar? How are they different?



**3.** Consider the function 

Degree:

Leading Term:

a. Draw a graph of *y3* in the window

xmin= -10, xmax= 10, ymin= -300, ymax= 300.



b. Where are the *x* intercepts?

c. How are the graphs of  and

 similar? How are they different?

**4.** Consider the function 

Degree:

Leading Term:

a. Draw a graph of *y4* in the window

xmin= -10, xmax= 10, ymin= -200, ymax= 1100.

b. Where are the *x* intercepts?

c. How are the graphs of , ,

and  similar? How are they different?

**Multiplicity:**

Write a sentence or two that describes what happens to the graph of a polynomial near a root with an **even** multiplicity.

**5.** Consider the function  **6.** Consider the function 

Draw a graph of *y5* in the window Draw a graph of *y6* in the window

xmin= -10, xmax= 10, ymin= -1600, ymax= 400. xmin= -10, xmax= 10, ymin= -300, ymax= 600.

Degree:

Leading Term:

Degree:

Leading Term:





Write a sentence or two that describes what happens to the graph of a polynomial near a root with an **odd** multiplicity.

**7.** Make a rough sketch of each of the following polynomials **without** using a graphing calculator.

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