Warm-Up

Factor each completely.

1) $5x^2 - 55x + 90$

2) $2v^2 + 9v + 7$

Warm-Up

Factor each completely.

1) $5x^2 - 55x + 90$

$5(x - 9)(x - 2)$

2) $2v^2 + 9v + 7$

$(2v + 7)(v + 1)$

Unit 3: Polynomial Functions

4.1 Notes (part 1) – Types of Polynomials & Their Graphs

Learning Targets:

- I can identify polynomial functions and their parts.
- I can graph polynomial functions using desmos.

Let's Explore…

1) With your partner, examine each graph and its function. What connections can you make?

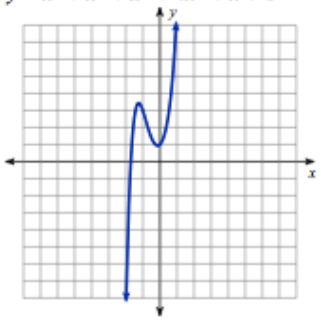
Algebra 2 - Unit 3

Name_____

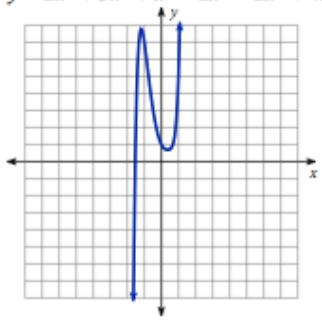
Unit 3 Exploration

Date_____ Period____

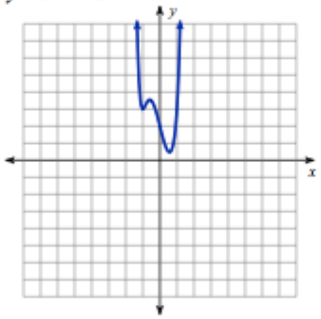
1) $y = x^5 + x^4 + x^3 + 4x^2 + x + 1$



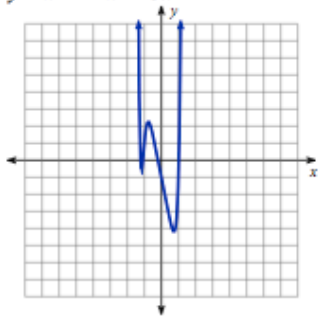
2) $y = 2x^7 + 3x^6 + x^5 - 2x^4 - 2x^3 + 4x^2 - 2x + 1$



3) $y = x^8 + 4x^3 - 4x + 2$



4) $y = x^{12} + 4x^7 - 5x - 1$



Vocabulary:

- A **monomial** is a number, variable, or the product of a number and one or more variables.

Examples:

$4xy$ $\quad$ 2.73 $\quad$ $-\frac{3}{a}$ $\quad$ b $\quad$ c^4

- A **polynomial** is a monomial or a sum of monomials.
  - Its exponents must be whole numbers.

Examples:

$4xy + 2a$ $\quad$ $2.73 - 5x^2$ $\quad$ $-\frac{3}{a} - 6w^2y^4 + b$

Vocabulary:

Example: $7x^5 + 3x^4 - 9x^2 + 10$

- This polynomial has 4 **terms**.
- The **coefficients** for each term are 7, 3, and -9.
- This polynomial is written in **standard form**, meaning it is written so that the exponents go in descending order.
- Since the 7 is the coefficient of the variable with the biggest exponent, it is called the **leading coefficient**.
- This polynomial is a 5^{th} **degree** polynomial because it's biggest exponent is 5.

Common Polynomial Functions			
Degree	**Type**	**Standard Form**	**Example**
0			
1			
2			
3			
4			

Naming Polynomials Recap:

Naming by *degree*
(biggest exponent)

5 ⟶ constant

$5x$ ⟶ linear

$5x^2$ ⟶ quadratic

$5x^3$ ⟶ cubic

Naming by *# of terms*

$5x^4$ ⟶ monomial

$5x^4 + x^3$ ⟶ binomial

$5x^4 + x^3 + x^2$ ⟶ trinomial

$5x^4 + x^3 + x^2 + x$ ⟶ polynomial

Examples: Determine whether each function is a polynomial function. If so, state its degree, type, & leading coefficient.

1) $f(x) = -2x^3 + 8$ yes → cubic, binomial, leading coefficient is -2

2) $g(x) = -0.8x + \sqrt{2}x^2 - 12$

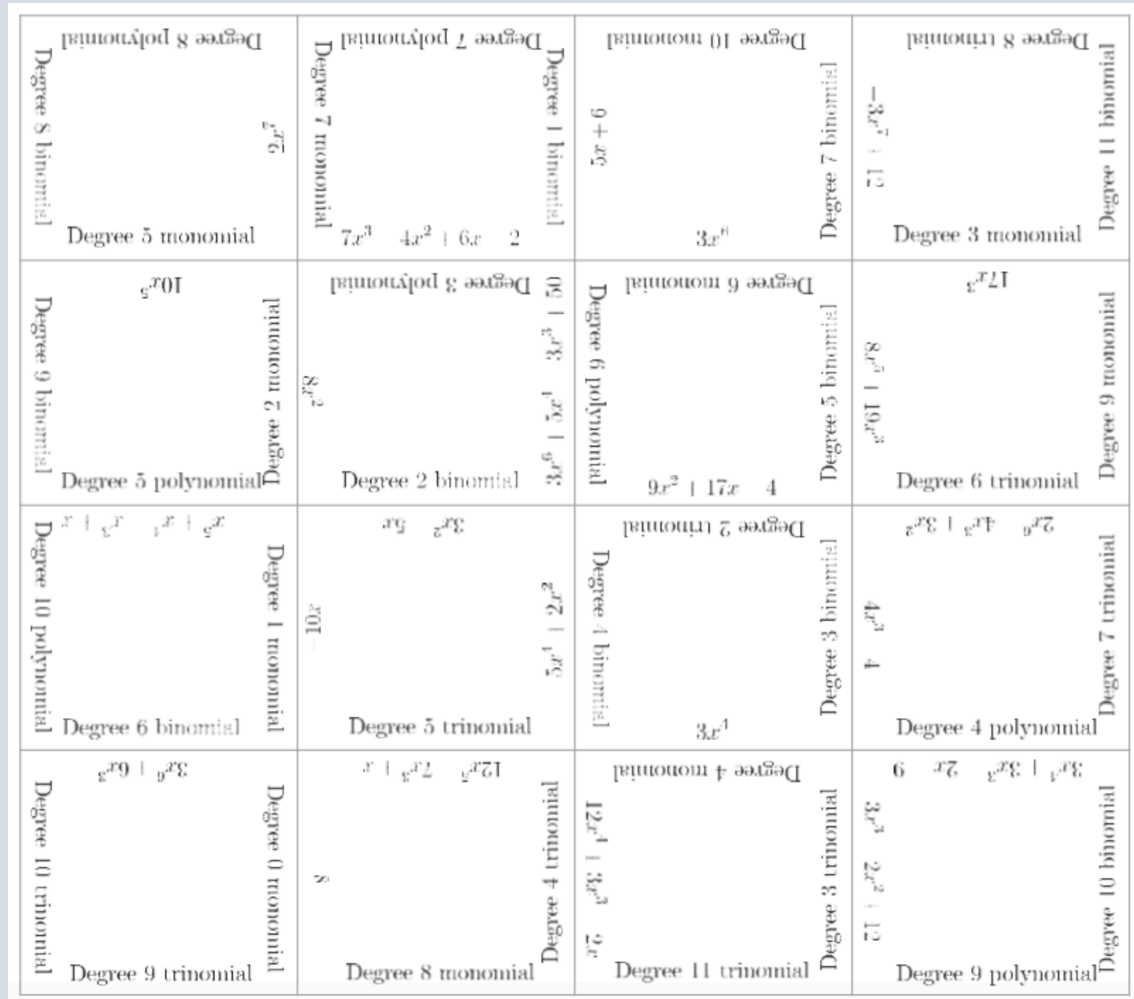
$g(x) = \sqrt{2}x^2 - 0.8x - 12$ yes → quadratic, trinomial, leading coefficient is $\sqrt{2}$

3) $h(x) = -x^2 + 7x^{-1} + 4x$ no → the -1 exponent is not a whole number

4) $k(x) = x^2 + 3^x$ no → the x exponent is not a whole number

Activity!


I'm so excited!


Degree 5 monomial
Degree 3 monomial
Degree 5 polynomial
Degree 2 binomial
Degree 6 trinomial
Degree 6 binomial
Degree 5 trinomial
Degree 4 polynomial
Degree 9 trinomial
Degree 8 monomial
Degree 11 trinomial
Degree 9 polynomial