Lesson Title 5.2 Polynomial Functions DAY ONE NOTES **B2A2** **Date** _____

OBJECTIVE 1: Defining Polynomial, Monomial, Binomial, Trinomial, & Degree

- A coefficient is the numerical factor of each term (the number in front of the variable.)
  - If there is no number in front, then it is a one.
- A constant is the term that only has a number and no variable.

TASK 1: Write an expression of your own choosing.

$-7x^3 + 2x^2 - 1x + 4$

a) Circle the coefficients.

b) Box the constant term.

- A polynomial function is in standard form when the exponents are in descending order (largest to smallest) from left to right.
- A monomial is exactly one term.
- A binomial has exactly two terms.
- A trinomial has exactly three terms.
- A polynomial has four or more terms.

TASK 2: Write each expression in standard form and place it in the appropriate column. Then label.

a) $x^5 + 7x^2 - x$ — trinomial

b) $x + y$ — binomial

c) $x^6 + x^4 - x^3 + 1$ — polynomial

d) 4 — monomial

- A degree of a term is the sum of the exponents on the variables contained in the term.
- A degree of a constant is zero because there is not variable to have an exponent.
- A degree of a polynomial is the value of the largest degree of a term within the expression.

TASK 3: State the degree, and label with: monomial, binomial, trinomial, or polynomial.

a) $5y^3$ — 3: monomial

b) y — 1: monomial

c) -2^3x^5 — 5: monomial ($-8x^5$)

d) 5 — 0: monomial

e) $-2v^2 + 3v + 6$ — 2: trinomial

f) $15x - 10$ — 1: binomial

TASK 4: Write each term, identify its coefficient and degree: $7x^2y - 6xy + x^2 - 3y + 7$.

	a	b	c
a	$7x^2y^1$	$-6x^1y^1$	x^2	$-3y$	7
b	7	-6	1	-3	none
c	3	2	2	1	0

OBJECTIVE 2: Synthetic Substitution

Normally you see f(x) or P(t) so when those change to become f(- 2) or P(5) that means you replace the x and t respectively with – 2 and 5. Then simplify.

STEPS:

- *First, write out the entire function with the variable replaced with its new value.*
- *Second, use your calculator to simplify.*
- *Third, write your answer two ways: function notation and coordinate notation.*
  - *ie: When x = 1 then y = 4 would be P(1) = 4 and (1, 4).*

TASK 5: If $P(x) = 3x^2 - 2x - 5$, find the following.

a) P(1) ⇒ x = 1

$P(1) = 3(1)^2 - 2(1) - 5$

$= 3 - 2 - 5$

$= -4$

P(1) = -4

(1, -4)

b) P(- 2) ⇒ x = -2

$P(-2) = 3(-2)^2 - 2(-2) - 5$

$= 12 + 4 - 5$

$= 11$

P(-2) = 11

(-2, 11)

TASK 6: Real-World Application

Finding the Height of a Dropped Object

The Swiss Re Building, in London, is a unique building. Londoners often refer to it as the "pickle building." Neglecting air resistance, the height in feet of the object above ground at time t seconds is given by the polynomial function $P(t) = -16t^2 + 592.1$. Find the height of the object when t = 1 second, and when t = 6 seconds. (*HINT: cross off useless sentences.*)

$P(1) = -16(1)^2 + 592.1$

$= 576.1$ ft

P(1) = 576.1 ft

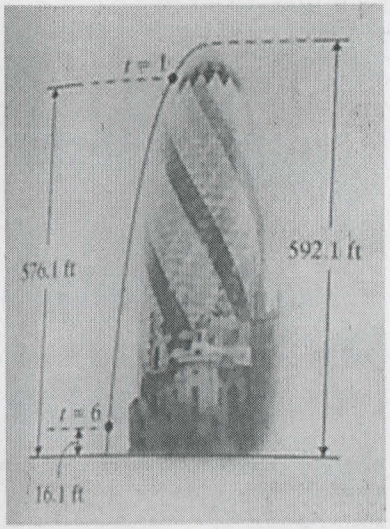
(1, 576.1)

$P(6) = -16(6)^2 + 592.1$

$= 16.1$ ft

P(6) = 16.1 ft

(6, 16.1)



Still need help with: