Warm Up

- **Complete the warm up in your journal!**

Use the FOIL Method or the Box Method to simplify the following **binomials**:

$(x-3)(x+4)$

	x	-3
x	x^2	$-3x$
4	$4x$	-12

x^2+x-12

$(2x+4)(2x+3)$

$4x^2+6x+8x+12$

$4x^2+14x+12$

$(x-7)(x-6)$

	x	-7
x	x^2	$-7x$
-6	$-6x$	$+42$

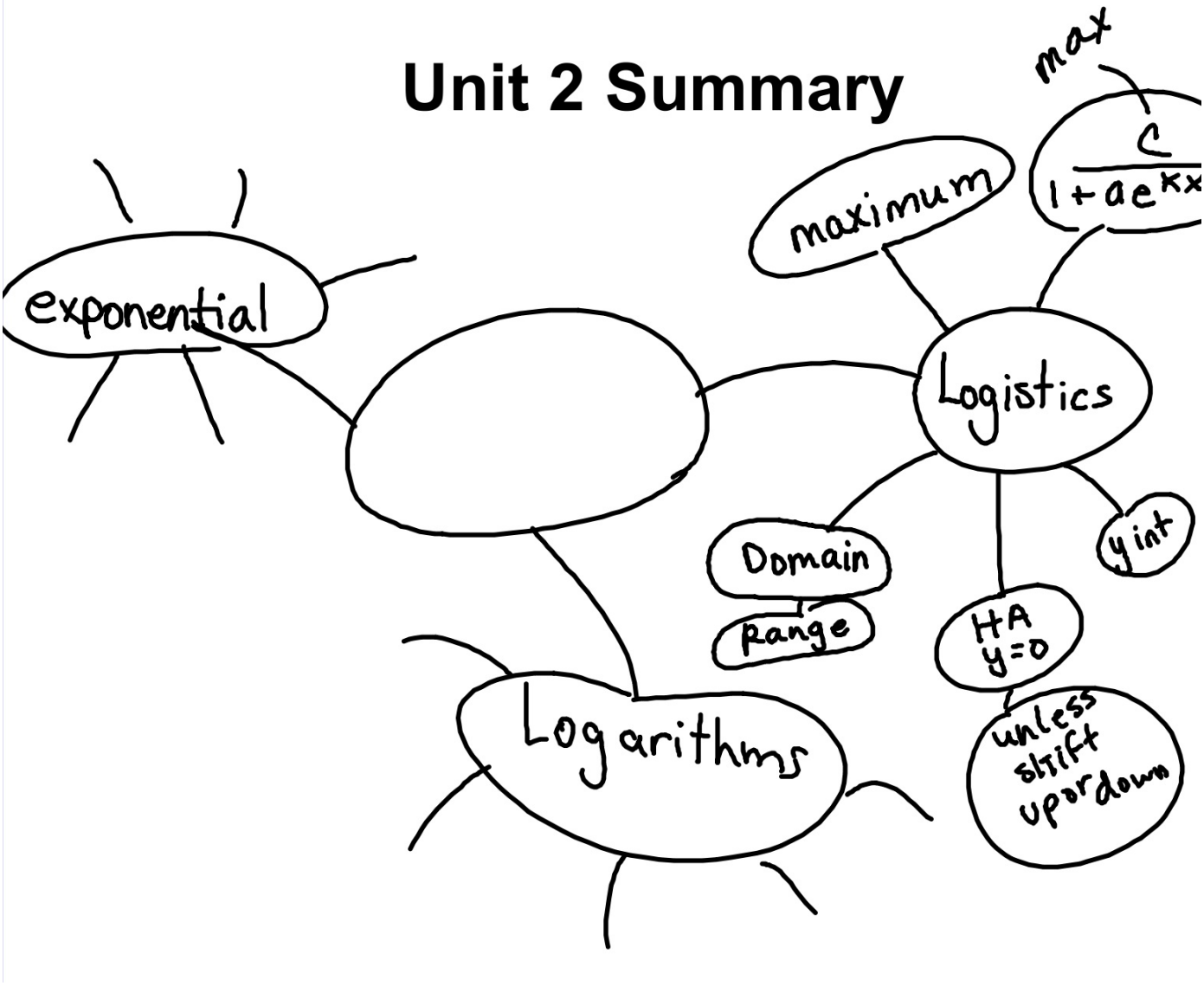
$x^2-13x+42$

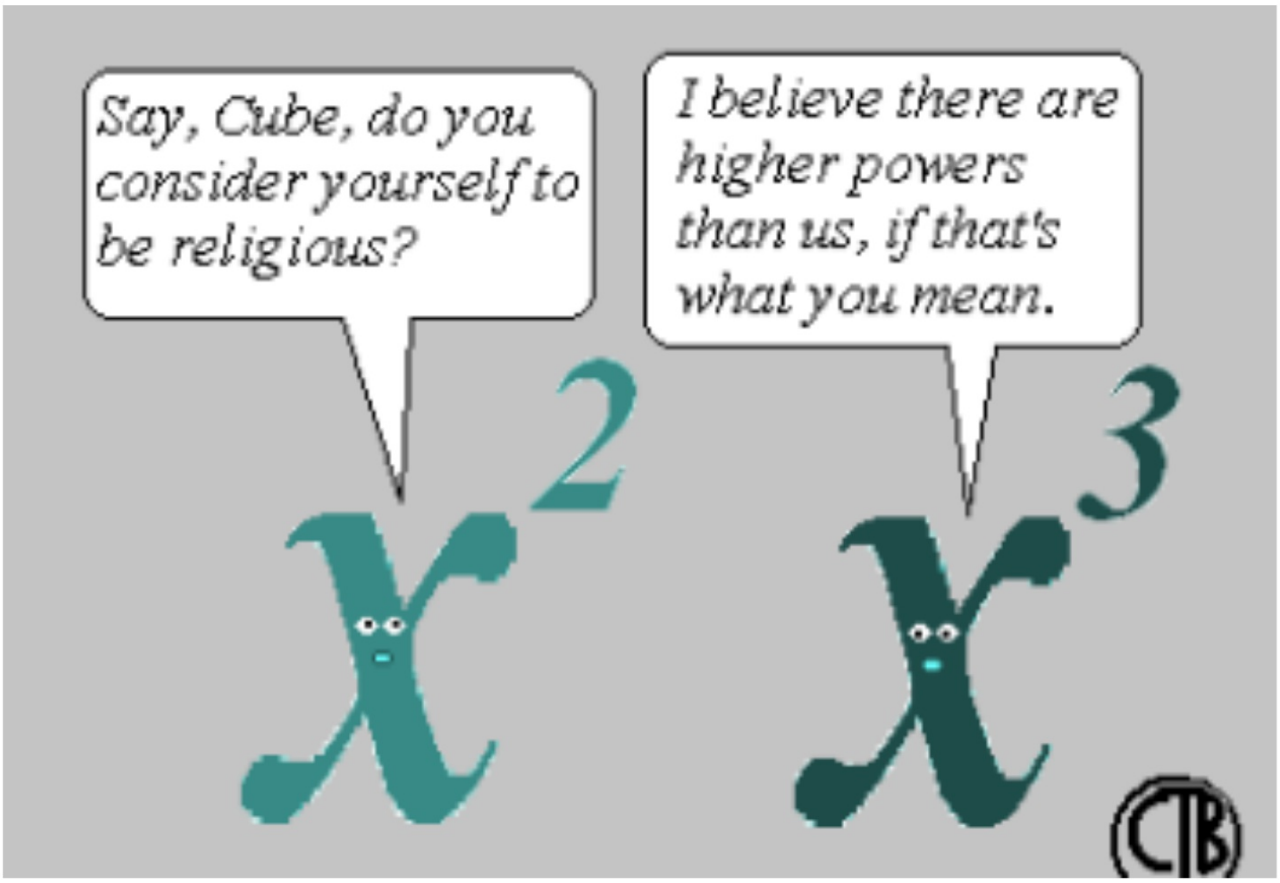
$(3x-1)(x+5)$

$3x^2+15x-x-5$

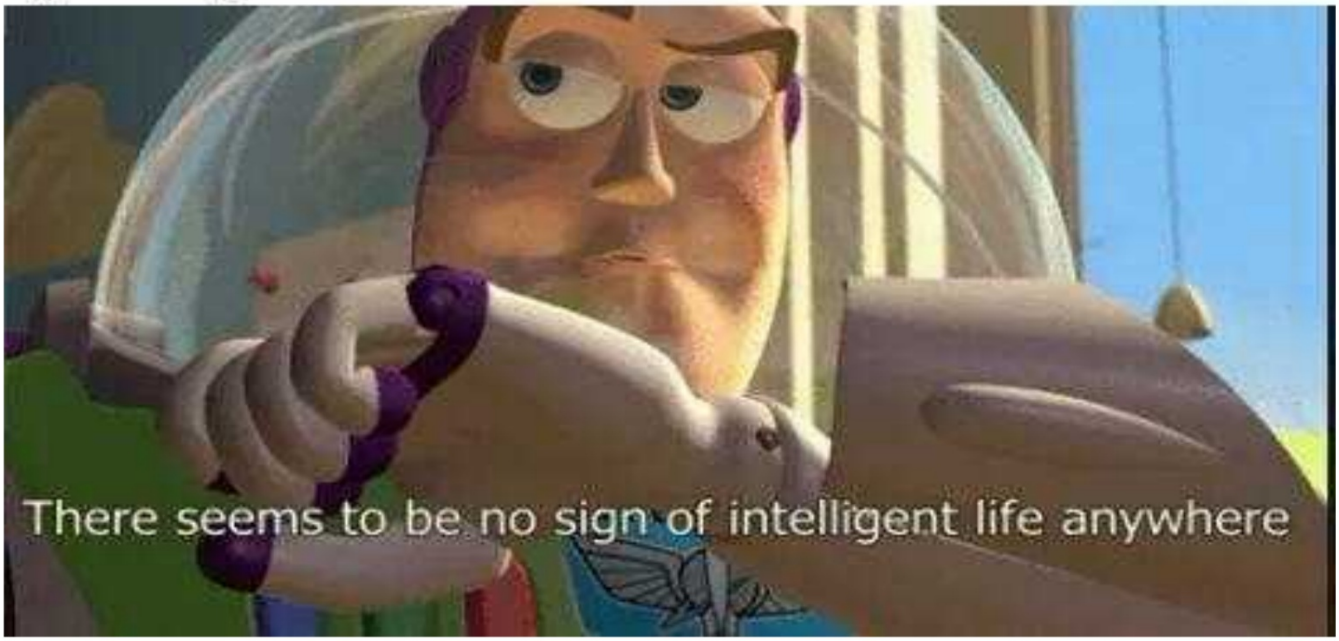
$3x^2+14x-5$

Unit 2 Summary




Say, Cube, do you consider yourself to be religious?
I believe there are higher powers than us, if that's what you mean.
x^2
x^3
CTB

When your entire friend group thinks maths is useless



The Unit Organizer

④ BIGGER PICTURE

NAME _____

DATE _____

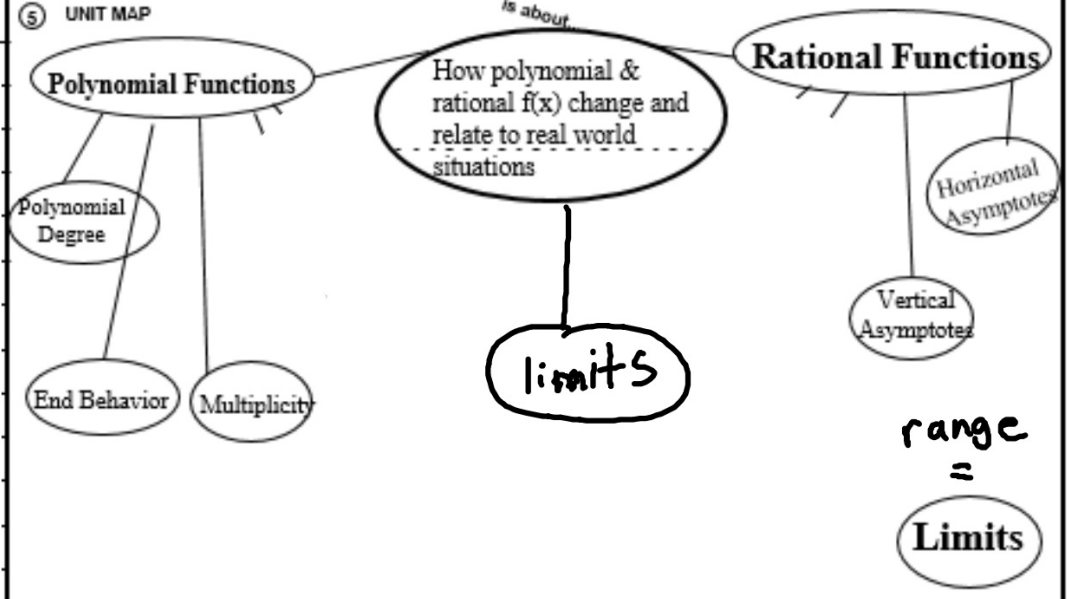
Honors PreCalculus

2: Expo, Log, Logi | **3: Polynomial and Rational f(x)s** | 4: Trigonometry

⑧ UNIT SCHEDULE

1 Vocab
2 Polynomials
2 Rationals
1 Limits

⑤ UNIT MAP



⑦ UNIT SELF-TEST QUESTIONS

1. How can I analyze polynomial & rational functions?
2. How can I find factors of functions?

⑥ UNIT RELATIONSHIPS

- Evaluate
- Graph & Transform
- Relate
- Apply

3.0 vocabulary Words

Polynomial Key Concepts

- Polynomial Degree
- End Behavior
- Standard Form
- Factored Form
- X Intercepts
- Y Intercept
- Multiplicity
- Leading Coefficient = a

Rational Key Concepts

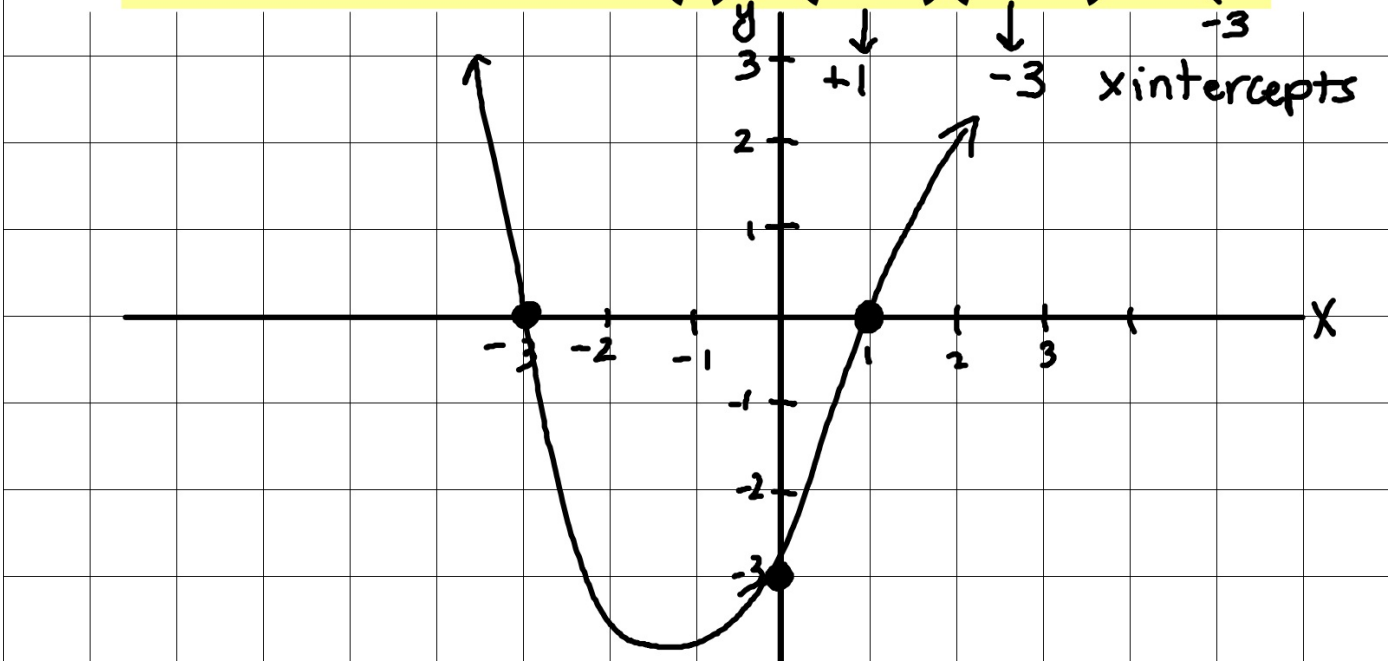
- x intercepts
- y intercepts
- horizontal asymptotes
  - → BOBØ
  - → EATS DC
  - → BOTN
  - → BOTS
- vertical asymptotes

3.1 Polynomial Functions

any function where there is a power that is a number; graphs are continuous, and do not have sharp turns

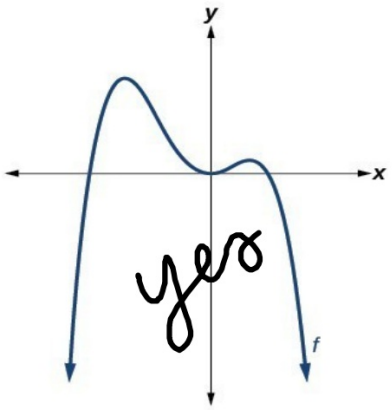
Standard Form: $f(x) = x^2 + 2x - 3$ (polynomial degree: 2)

Factored Form: $f(x) = (x - 1)(x + 3)$ (−3)



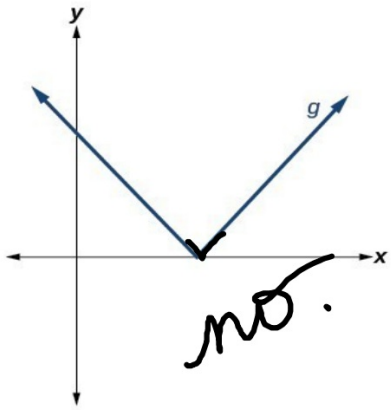
Are the following polynomial functions?

A



yes

B



no.

$|x|$

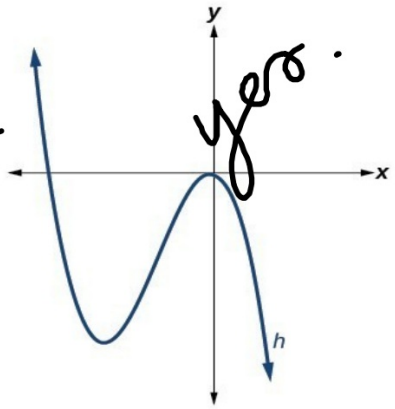
x^1

x^2

x^3

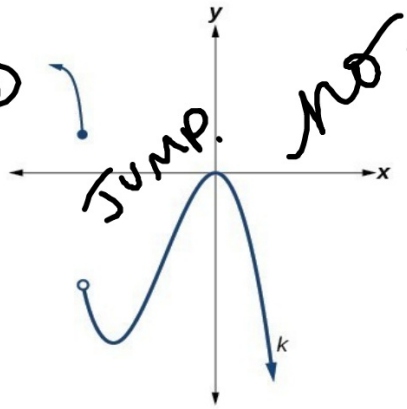
x

C



yes.

D



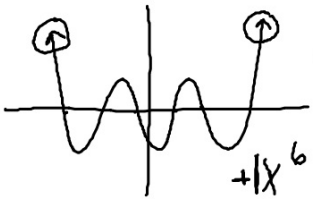
JUMP.

no.

3.1 Polynomial Degree & End Behavior

+ Even $x^2, x^4, \ldots$

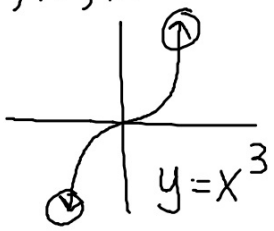
- ends match $(+\infty)$
- endspoint up



$+1x^6$ LC = +1

+ Odd $x^3, x^5, \ldots$

- ends are opposite
  - left side $\to (-\infty)$
  - right side $\to (+\infty)$
- LC = +1

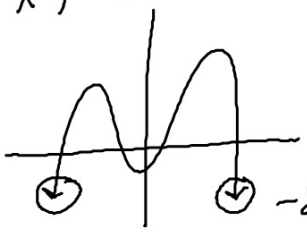


$y = x^3$

Polynomial Degree helps determine the shape of graph, end behavior.
LC helps determine " direction

- Even $-x^2, -x^4, \ldots$

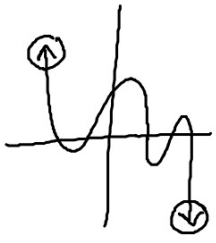
- end match $(-\infty)$
- endspoints down b/c of LC = -2



$-2x^4$

- Odd $-x^3, -x^5, \ldots$

- ends are opposite
  - left side $\to (+\infty)$
  - right side $\to (-\infty)$



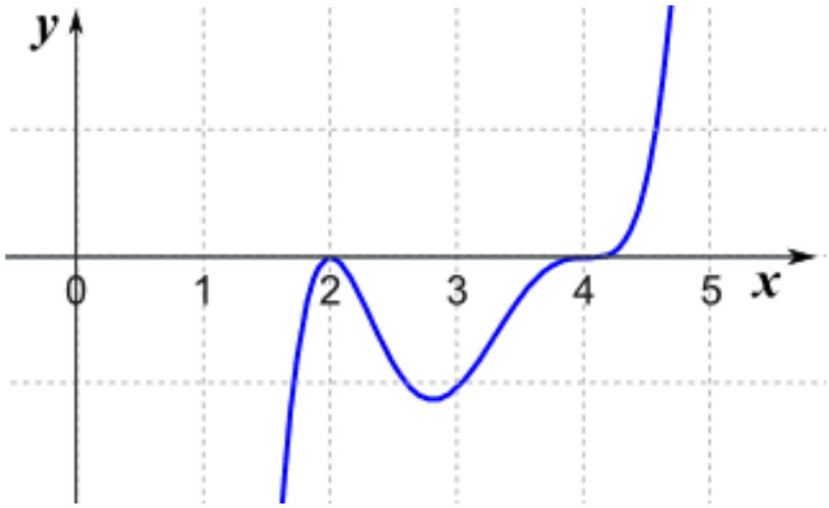
$-3x^5$ · LC = -3

Are the following even or odd?
Positive or negative?

X Intercepts & Multiplicity

cross	bounce	wiggle

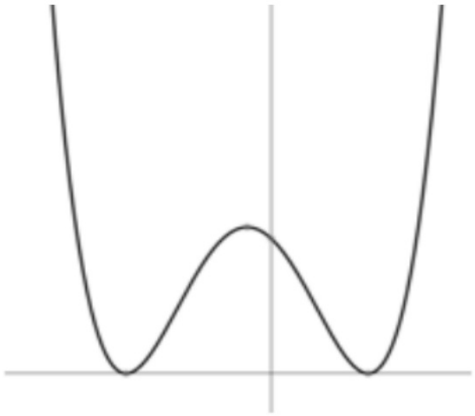
3.1 Write a Polynomial Equation from a graph



3.1 Write a Polynomial Equation from a graph

What might the equation of this graph be?

There is an additional piece of information on this graph.



Project Work Example Step 3

Wipplez $y = ae^{rt}$ years

initial day $(0, 4)$

Next day $(1, 20)$

$20 = 4e^{r(1)}$

$5 = e^{r}$

$\ln 5 = r$

$1.609 = r$

$160.9\% = r$

$y = 4e^{1.609t}$

CM: 2 kiwis 100 per day

$\frac{100}{2} = 50$ wipplez

$y = 4e^{1.609t}$

$50 = 4e^{1.609t}$

$12.5 = e^{1.609t}$

$2.526 = 1.609t$

$1.569 = t$ days

1.5 days to reach CM.

Threshold = 100 wipplez

$y = 4e^{1.609t}$

$100 = 4e^{1.609t}$

$25 = e^{1.609t}$

$\square = t$

Name_____

Objective 3.1: Creating Equations using Polynomial Degree, Multiplicity, & concepts **Unit 3**

Factored Form

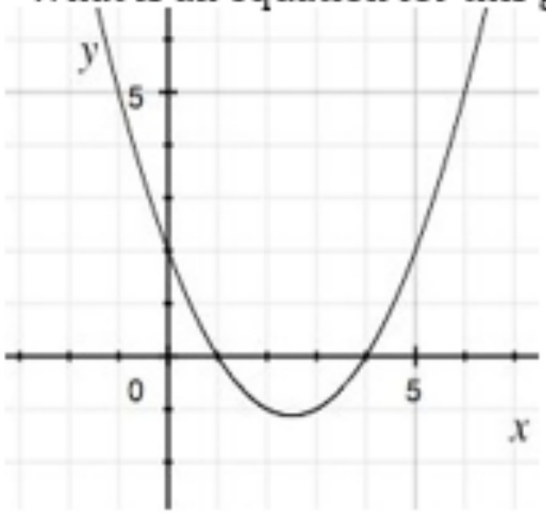
Standard Form

3.1 Creating Polynomials Examples & Practice

1. A function has the zeros 3, 6 and 1. Create a polynomial that has these zeros.

2. Create a polynomial that has the zeros 3, 6 and 1 and contains the point (4, 12)

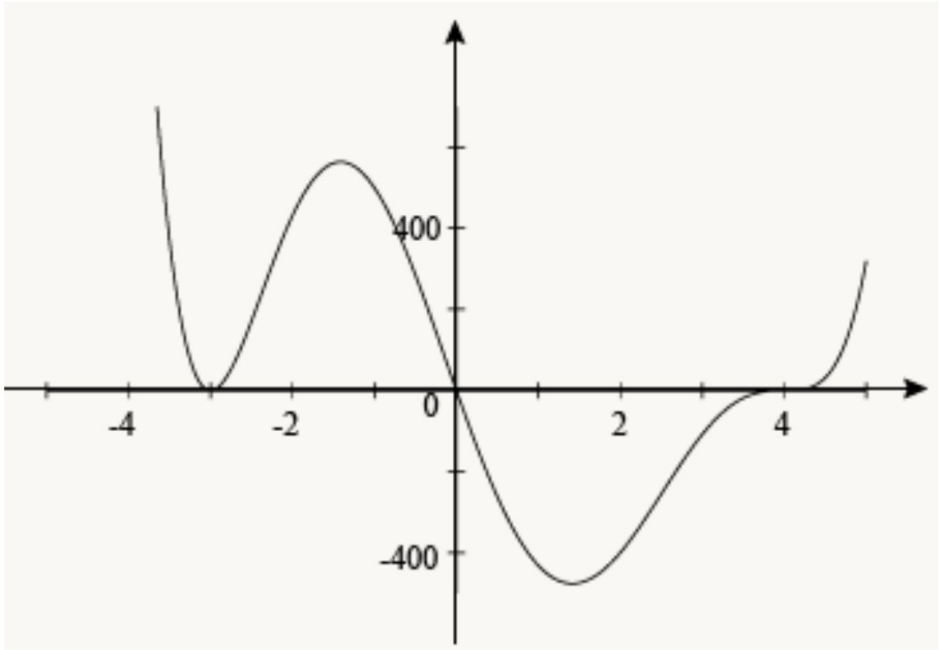
3. What is an equation for this graph:



4. Create a polynomial that has the x-intercepts (4, 0), (-2, 0) and (2, 0) and the y-intercept (0, 16).

5. Create a polynomial, f(x), that has zeros 2 and 3 and f(4) = 10

P-I-G Practice

- Complete the problems
- Check your work!
- Communicate effectively

<u>Exit Task:</u> Investigate the potential polynomial equation of this graph based on what you learned in class today. Write a letter to your favorite celebrity explaining your thoughts. Provide examples to really help them understand the math!