Lesson 1.6 Objective: SWBAT determine the key features of a polynomial function.

Kickoff

Find the average rate of change of the function, f(x) = x²-x between the values x= -1 and x = 3.

$(-1, 2)$　$(3, 6)$
　x1 y1　　x2 y2

$$\frac{\Delta y}{\Delta x} \quad \frac{6-2}{3-(-1)} \quad \frac{4}{4} \quad m = 1$$

Key Features of Polynomials

-Increasing

-Decreasing

-Zeros

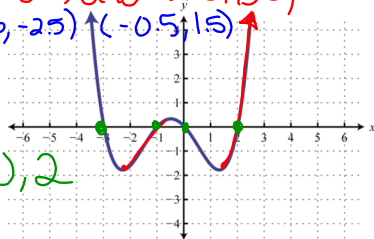-Relative minimum and maximum

-Symmetry

Increasing/Decreasing-
↳up　　↳down　　intervals using x-values
　　　　　　　　　　　　　　* ( )
Increasing·(-2.5,-0.5) and (1.5, ∞)
Decreasing: (-∞,-2.5) (-0.5, 1.5)
Zeros- roots/
x-intercepts
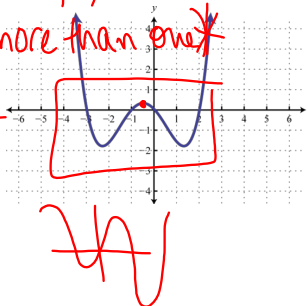X = -3, -1, 0, 2

Relative Minimum- Smallest pt inside the graph
(-2.5,-2) and (1.5,-2)
there can be more than one
Relative Maximum-
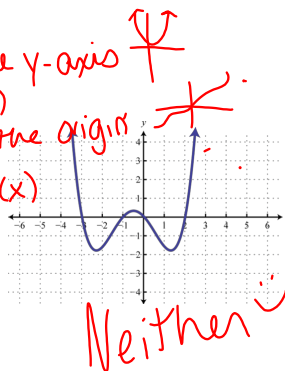highest pt inside the graph.
(-0.5, 0.5)

Symmetry

Even- Symmetric to the y-axis
Algebraic = f(x) = f(-x)
Odd- Symmetric to the origin
Algebraic = f(x) = -f(x)
Neither- not odd a even.

Neither

Symmetry Algebraically

1. $k(x) = \dfrac{x}{x^2+1}$

$$K(-x) = \frac{(-x)}{(-x)^2+1}$$
$$= \frac{-x}{x^2+1}$$
Odd

2. $m(x) = x^4 - |x|$

$$M(-x) = (-x)^4 - |(-x)|$$
$$= x^4 - |x|$$
Even

3. $t(x) = x + 6$
$$t(-x) = (-x) + 6$$
$$= -x + 6$$
Neither

Key Features	
End Behavior	Degree is _____ Leading Coefficient is _____
Domain	
Range	
Increasing	
Decreasing	
Roots	
x-intercept(s)	
y-intercept(s)	
Relative Maximum(s)	
Relative Minimum(s)	
Odd/Even/Neither	

Key Features	
End Behavior	Degree is _____ Leading Coefficient is _____
Domain	
Range	
Increasing	
Decreasing	
Roots	
x-intercept(s)	
y-intercept(s)	
Relative Maximum(s)	
Relative Minimum(s)	
Odd/Even/Neither	

Key Features	
End Behavior	Degree is _____ Leading Coefficient is _____
Domain	
Range	
Increasing	
Decreasing	
Roots	
x-intercept(s)	
y-intercept(s)	
Relative Maximum(s)	
Relative Minimum(s)	
Odd/Even/Neither	

Key Features	
End Behavior	Degree is _____ Leading Coefficient is _____
Domain	
Range	
Increasing	
Decreasing	
Roots	
x-intercept(s)	
y-intercept(s)	
Relative Maximum(s)	
Relative Minimum(s)	
Odd/Even/Neither	

Key Features	
End Behavior	Degree is _____ Leading Coefficient is _____
Domain	
Range	
Increasing	
Decreasing	
Roots	
x-intercept(s)	
y-intercept(s)	
Relative Maximum(s)	
Relative Minimum(s)	
Odd/Even/Neither	

Key Features	
End Behavior	Degree is _____ Leading Coefficient is _____
Domain	
Range	
Increasing	
Decreasing	
Roots	
x-intercept(s)	
y-intercept(s)	
Relative Maximum(s)	
Relative Minimum(s)	
Odd/Even/Neither	