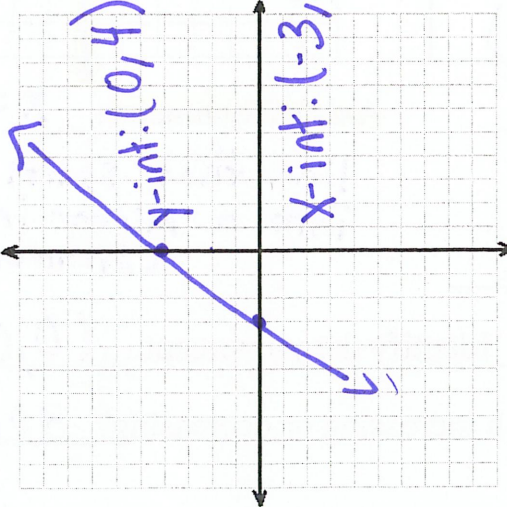
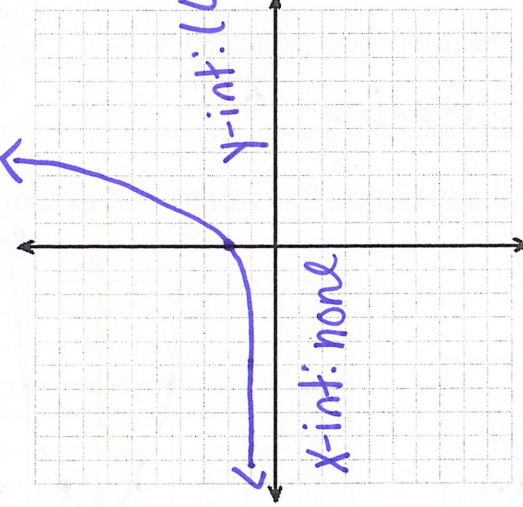
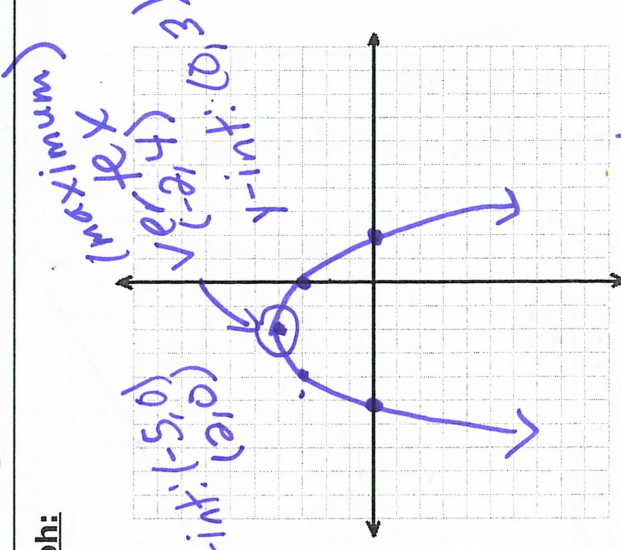


x-intercept - point that crosses the x-axis ($y=0$)
y-intercept - point that crosses the y-axis ($x=0$)

Name: Day 6

Linear Functions	Exponential Functions	Quadratic Functions
<p>Graph: No minimum or maximum</p>  <p>Key Features:</p> <ul style="list-style-type: none"> • straight line • constant slope • always increasing <u>or</u> decreasing • no exponents <p>Equation Example:</p> <ul style="list-style-type: none"> • $y = mx + b$; $y = 2x + 3$ 	<p>Graph:</p>  <p>Key Features:</p> <ul style="list-style-type: none"> • grows rapidly • Always increasing <u>or</u> decreasing • curve • Variable is in the exponent <p>Equation Example:</p> <ul style="list-style-type: none"> • $y = a \cdot b^x$, $y = 3^x$ 	<p>Graph:</p>  <p>Key Features:</p> <ul style="list-style-type: none"> • U shaped • parabola • increases and decrease • not a straight line • exponent is 2 (squared) <p>Equation Example:</p> <ul style="list-style-type: none"> • $y = ax^2 + bx + c$; $y = x^2 + 6x + 9$ $y = x^2 - 4$ <p>Vertex:</p> <ul style="list-style-type: none"> min U up max N down

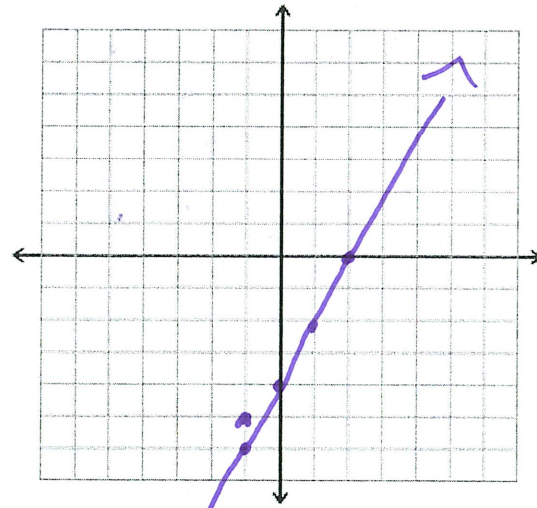
Objective: I can represent mathematical relationships using graphs.

Ex 1) Evaluate each function at the given values. Graph the values and determine if the graph is linear, quadratic, or exponential.

$f(x) = 2x - 4$

linear

x	$f(x) = 2x - 4$	f(x) (x, y)
-2	$f(-2) = 2(-2) - 4 = -4 - 4 = -8$	$(-2, -8)$
-1	$f(-1) = 2(-1) - 4 = -2 - 4 = -6$	$(-1, -6)$
0	$f(0) = 2(0) - 4 = 0 - 4 = -4$	$(0, -4)$
1	$f(1) = 2(1) - 4 = 2 - 4 = -2$	$(1, -2)$
2	$f(2) = 2(2) - 4 = 4 - 4 = 0$	$(2, 0)$



Identify the x-intercept: (2, 0) Identify the y-intercept: (0, -4)

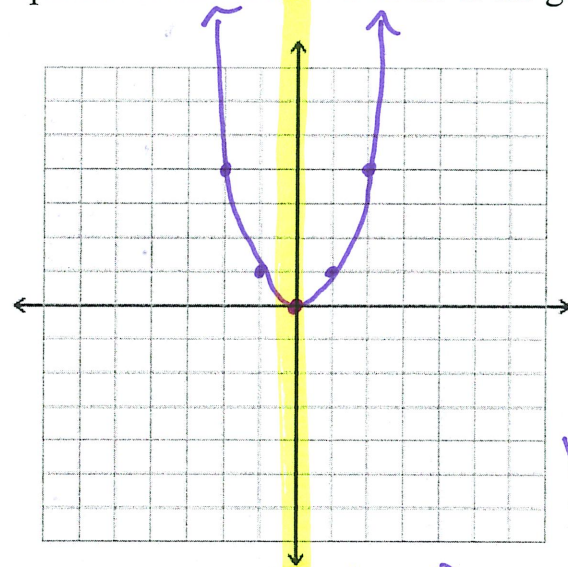
Is the graph increasing or decreasing? increasing

Ex 2) Evaluate each function at the given values. Graph the values and determine if the graph is linear, quadratic, or exponential.

$f(x) = x^2$

quadratic

x	$f(x) = x^2$	f(x)
-2	$f(-2) = (-2)^2 = 4$	$(-2, 4)$
-1	$f(-1) = (-1)^2 = 1$	$(-1, 1)$
0	$f(0) = (0)^2 = 0$	$(0, 0)$
1	$f(1) = (1)^2 = 1$	$(1, 1)$
2	$f(2) = (2)^2 = 4$	$(2, 4)$



Identify the vertex: (0, 0)

Axis of Symmetry: x = 0

line that splits the graph into a mirror image (symmetric)

look at x-value vertex

axis of sym.

Minimum or Maximum: minimum

Identify the x-intercept: (0, 0) Identify the y-intercept: (0, 0)

For x-values that are less than 0, is the graph increasing or decreasing? decreasing

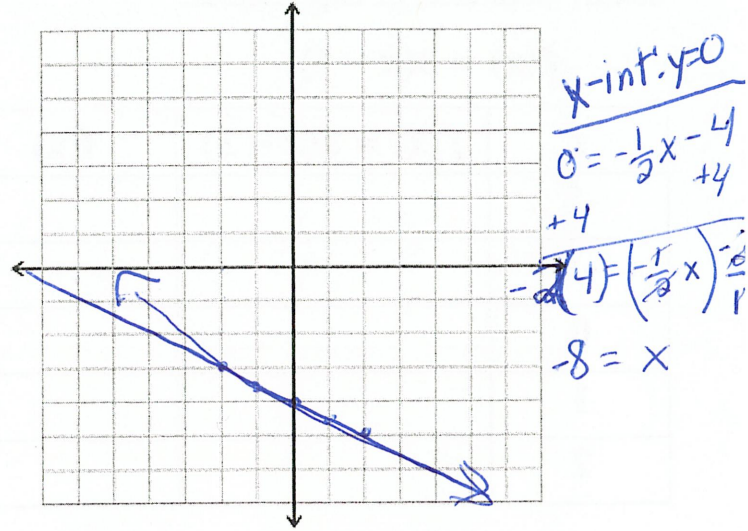
(left or right)
left

Ex 3) Evaluate each function at the given values. Graph the values and determine if the graph is linear, quadratic, or exponential.

$$f(x) = -\frac{1}{2}x - 4$$

linear

x	$f(x) = -\frac{1}{2}x - 4$	f(x)
-2	$= -\frac{1}{2}(-2) - 4 = -3$	$(-2, -3)$
-1	$= -\frac{1}{2}(-1) - 4 = -3\frac{1}{2}$	$(-1, -3\frac{1}{2})$
0	$= -\frac{1}{2}(0) - 4 = -4$	$(0, -4)$
1	$= -\frac{1}{2}(1) - 4 = -4\frac{1}{2}$	$(1, -4\frac{1}{2})$
2	$= -\frac{1}{2}(2) - 4 = -5$	$(2, -5)$



Identify the x-intercept: $(-8, 0)$ Identify the y-intercept: $(0, -4)$

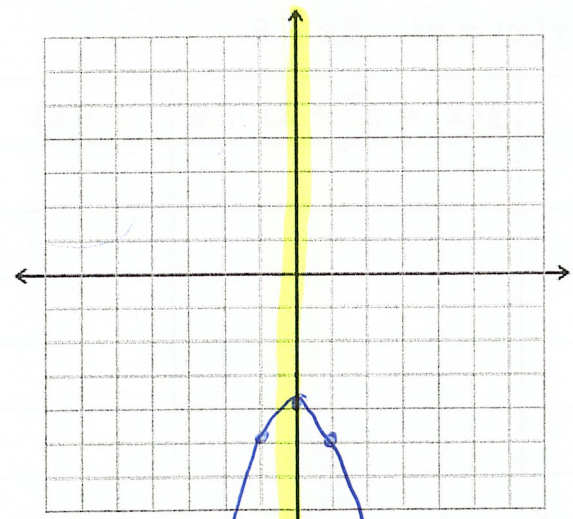
Is the graph increasing or decreasing? decreasing

Ex 4) Evaluate each function at the given values. Graph the values and determine if the graph is linear, quadratic, or exponential.

$$f(x) = -x^2 - 4$$

quadratic

x	$f(x) = -x^2 - 4$	f(x)
-2	$= -(-2)^2 - 4 = -8$	$(-2, -8)$
-1	$= -(-1)^2 - 4 = -5$	$(-1, -5)$
0	$= -(0)^2 - 4 = -4$	$(0, -4)$
1	$= -(1)^2 - 4 = -5$	$(1, -5)$
2	$= -(2)^2 - 4 = -8$	$(2, -8)$



Identify the vertex: $(0, -4)$ Axis of Symmetry: $x=0$

Minimum or Maximum: max

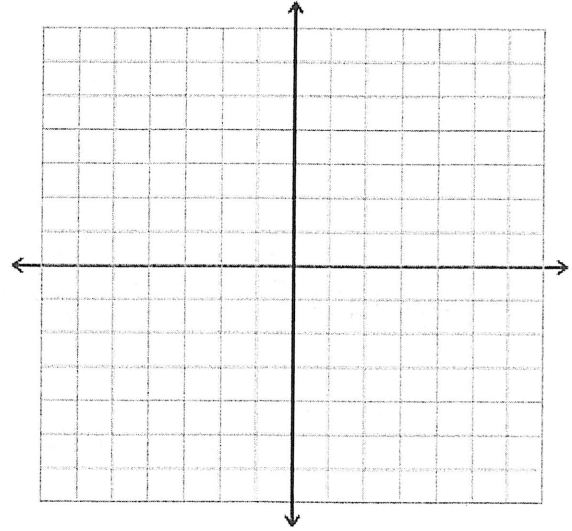
Identify the x-intercept: no Identify the y-intercept: $(0, -4)$

For x-values that are less than 0, is the graph increasing or decreasing? increasing

Ex 5) Evaluate each function at the given values. Graph the values and determine if the graph is linear, quadratic, or exponential.

$$f(x) = 3(x - 1)$$

x	$f(x) = 3(x - 1)$	f(x)
-2		
-1		
0		
1		
2		



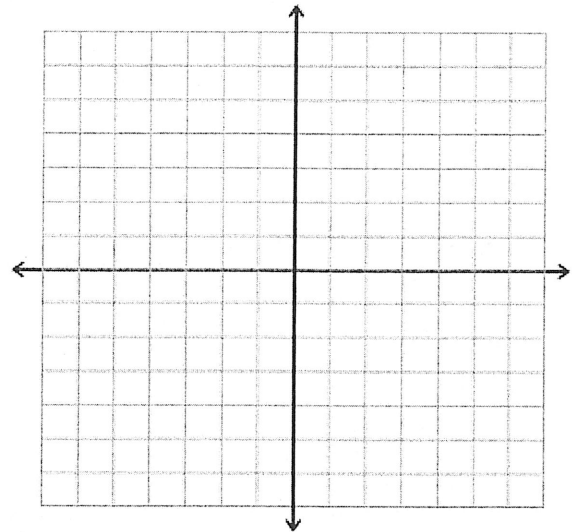
Identify the x-intercept: _____ Identify the y-intercept: _____

Is the graph increasing or decreasing? _____

Ex 6) Evaluate each function at the given values. Graph the values and determine if the graph is linear, quadratic, or exponential.

$$f(x) = x^2 + 2x + 6$$

x	$f(x) = x^2 + 2x + 6$	f(x)
-2		
-1		
0		
1		
2		



Identify the vertex: _____

Axis of Symmetry: _____

Minimum or Maximum: _____

Identify the x-intercept: _____ Identify the y-intercept: _____

For x-values that are less than 0, is the graph increasing or decreasing? _____