Topic: IM2 – 3.1 (N – 1) Key Characteristics of Quadratic Graphs	**Standard(s):** F.IF.4, F.IF.5	Notes
Essential Question: How can I identify the key characteristics of quadratic graphs?		

Questions / Big Ideas

Key Terms

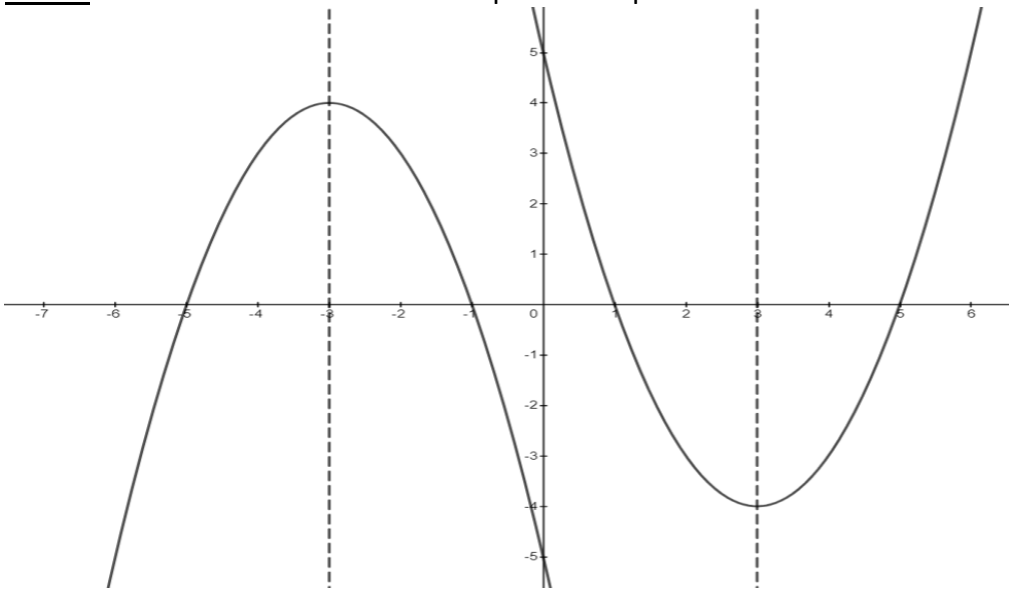
Parabola ≡ a symmetrical open plane curve.

- The path of a projectile under the influence of gravity ideally follows a curve of this shape.

Extrema ≡ any point at which the value of a function is largest (a maximum) or smallest (a minimum).

- Minimum ≡ the lowest point on a graph.
- Maximum ≡ the highest point on a graph.

Vertex ≡ This maximum or minimum point on a parabola.

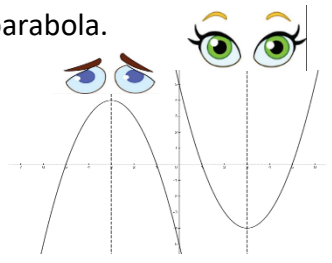


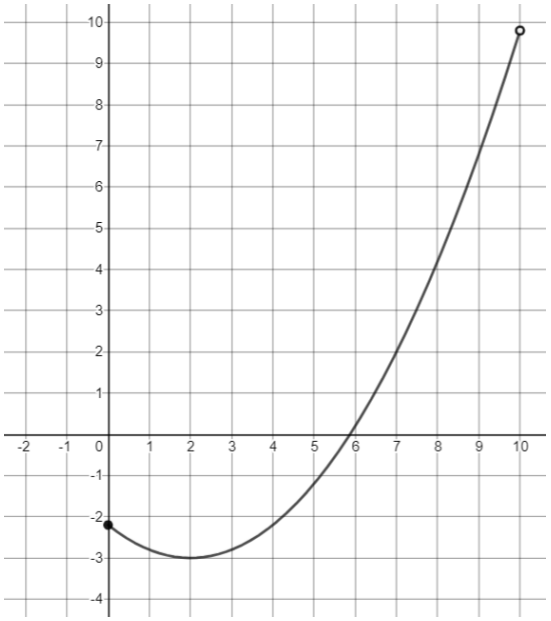
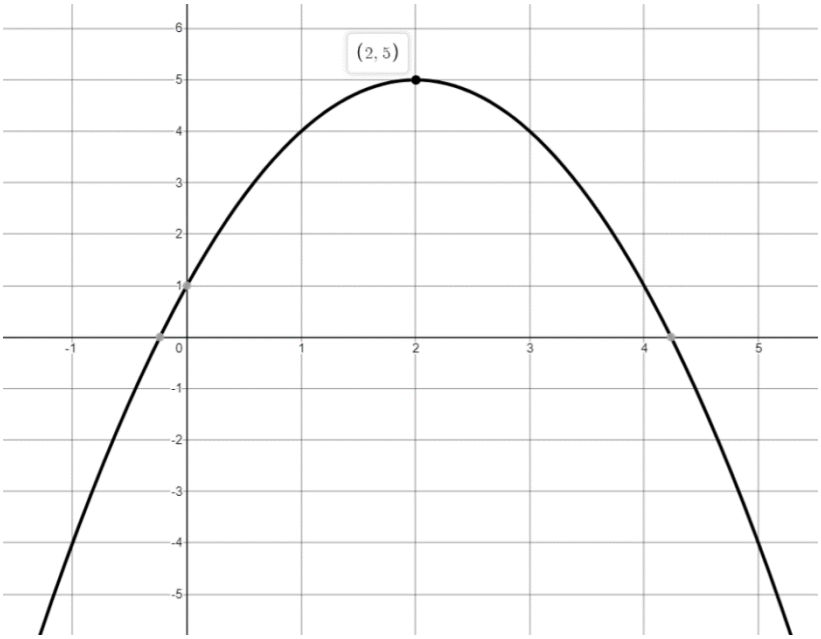
Axis of Symmetry (AoS) ≡ a line that passes through the vertex of a parabola, showing each side as a mirror image.

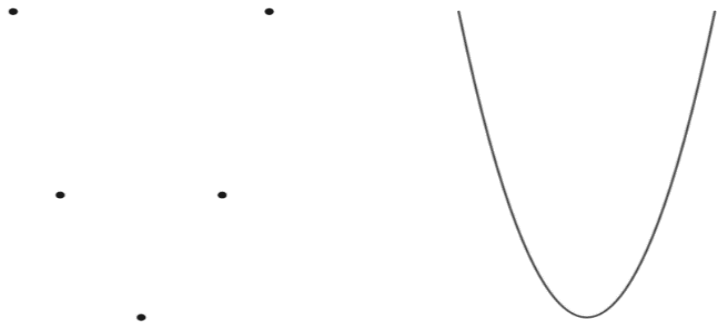
- Each point on a parabola is equidistant from a point on the opposite side of the axis of symmetry.

Concavity ≡ the directionality of a curve, such as a parabola.

- Convex ≡ parabola opens UP (smiles)
- Concave ≡ parabola opens DOWN (frowns)



Questions / Big Ideas	*Domain* ≡ The set of input values for a given situation. • Ex. All x-values between zero and 10, including zero. Written in inequality notation: $0 \leq x < 10$  *Interval of Increase* ≡ the values across the domain (as it increases from left to right) where the graph's range also increases. The extrema are NOT included within this interval. • Ex. $-\infty < x < 2$ *Interval of Decrease* ≡ the values across the domain (as it increases from left to right) where the graph's range decreases. The extrema are NOT included within this interval. • Ex. $2 < x < \infty$ 

Questions / Big Ideas	*Continuous* ≡ measured data.
	
	• A graph of points that are connected by a line or smooth curve. They have no breaks.
	
	Discrete ≡ counted data.
	
	• A graph of isolated (unconnected) points.
	
	 
	
	Intercepts ≡ $(\mathrm{x},\ \mathrm{y})$, the points where a *graph* crosses an axis.
	
	• y-intercept
	  ○ The location where a graph crosses the y-axis
	  ○ Location where x is 0 on the graph: coordinate: $(\boldsymbol{0}, \boldsymbol{y})$
	
	• x-intercept
	  ○ The location where a graph crosses the x-axis
	  ○ Location where y is 0 on the graph: coordinate: $(\boldsymbol{x}, \boldsymbol{0})$
	
	Zeros ≡ the numeric x-value of a function written as $x = \#$
	
	• Ex. $f(x) = x + 1$ is $x = -1$.
	
	Roots ≡ the numeric value of an equation when the equation equals zero.
	
	• Ex. $x + 1 = 0$ means the root is -1.
	• Roots are written as a sentence, for example:
	"The roots are 4 and 10."

Summary: _____

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