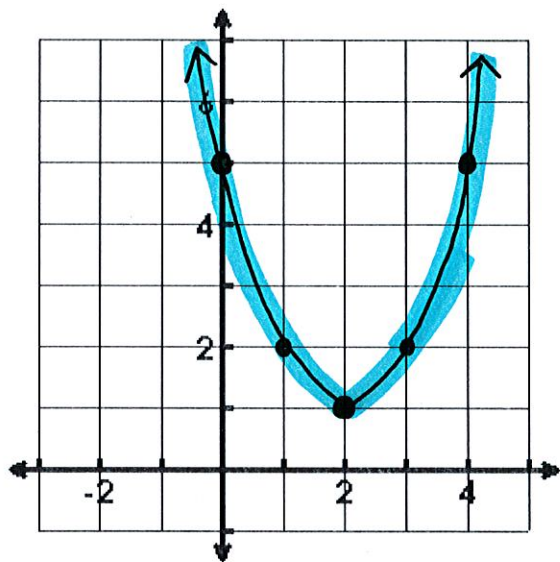


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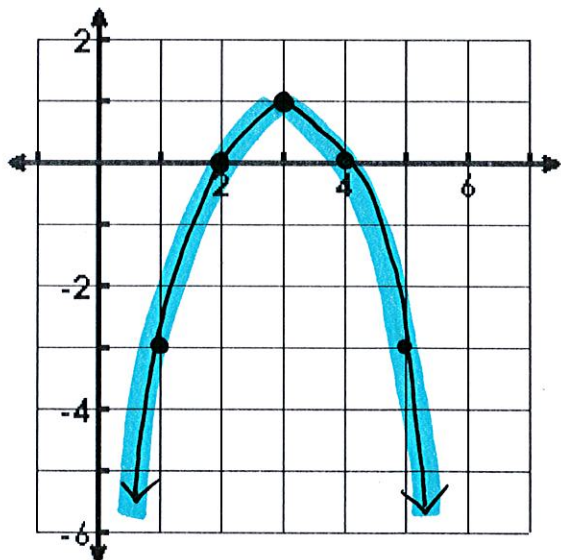
Graphing Quadratic Equations in Standard Form

1. $f(x) = x^2 - 4x + 5$

 $a=1$ — opens up $h=2$
 $k=1$ } $(2, 1)$ 

Characteristics	
A.O.S.	$x=2$
Vertex:	$(2, 1)$
Domain:	\mathbb{R}
Range:	$[1, \infty)$
Solution(s):	none!
"c" value y-intercept:	$(0, 5)$
Interval of Increase:	$(2, \infty)$
Interval of Decrease:	$(-\infty, 2)$
Rate of change from $3 \leq x \leq 4$:	3
Rate of change from $0 \leq x \leq 2$:	-2
Which rate of change is steeper? Why?	3 because $3 > 2$

2. $f(x) = -x^2 + 6x - 8$

 $a=-1$ — opens down $h=3$
 $k=1$ } $(3, 1)$ 

Characteristics	
A.O.S.	$x=3$
Vertex:	$(3, 1)$
Domain:	\mathbb{R}
Range:	$(-\infty, 1]$
Zero(s):	$(2, 0)$ & $(4, 0)$
"c" value y-intercept:	$(0, -8)$
Interval of Increase:	$(-\infty, 3)$
Interval of Decrease:	$(3, \infty)$
Rate of change from $3 \leq x \leq 4$:	-1
Rate of change from $4 \leq x \leq 5$:	-3
Which rate of change is steeper? Why?	-3 because $3 > 1$

3. A baker has modeled the monthly operating costs for making wedding cakes by the function $y = 0.5x^2 - 12x + 150$ where y is the total cost in dollars and x is the number of cakes prepared. $a=0.5$ $h=12$ $k=78$

A. Find the **vertex** and **axis of symmetry**. The vertex would represent (Cakes Prepared, \$Cost).

$$(12, 78) \quad x=12$$

B. What is the **minimum** monthly operating **cost**?

$$\rightarrow \text{y-value of vertex (k)} \quad \$78$$

C. How many **cakes** should be prepared each month to yield the minimum operating cost?

$$\rightarrow \text{x-value of vertex (h)} \quad 12$$

D. What are the baker's costs if he/she makes **no cakes (zero)**?

$$\$150 \quad \rightarrow \text{y-intercept (c-value)}$$

4. The path of a soccer ball is modeled by the function $h(x) = -0.005x^2 + 0.25x$, where h is the height in meters and x is the horizontal distance that the ball travels in meters. What is the **maximum height** that the ball reaches? Hint: start by finding the vertex.

$$a = -1/200 = -0.005$$

$$h = 25$$

$$k = 25/8 = 3.125$$

$$\rightarrow \text{y-value of vertex (k)} \quad 3.125$$

5. The function $A(x) = x(10 - x)$ describes the area A of a rectangular flower garden, where x is its width in yards. What is the **maximum area** of the garden? Hint: get your equation in standard form 1st and then start finding the vertex.

$$x(10-x) \quad a = -1$$

$$10x - x^2 \quad h = 5$$

$$-x^2 + 10x \quad k = 25$$

$$\rightarrow \text{y-value of vertex (k)} \quad 25$$

6. A record label uses the following function to model the sales of a new release.

$$a(t) = -90t^2 + 8100t$$

The number of albums sold is a function of time, t , in days. On which **day** were the **most** albums sold? What is the **maximum** number of **albums** sold on that day?

$$a = -90$$

$$h = 45$$

$$k = 182250$$

$$\text{most albums sold... 45th day}$$

$$\text{maximum \# of albums... 182,250}$$