

NAME:

DATE:

Key

A2.Q2.BERMELLEEMBO: THE QUADRATIC FUNCTION'S GRAPH

DAY G3

(GRAPHING AND ANALYSIS)

REVIEW

1. $f(x) = (x+2)^2 - 9$

$a = +1$

Is the graph of $y = f(x)$ concave up or concave down? How do you know?

Concave up b/c a is positive $a > 0$

Equation for Axis of Symmetry:

$x = -2$

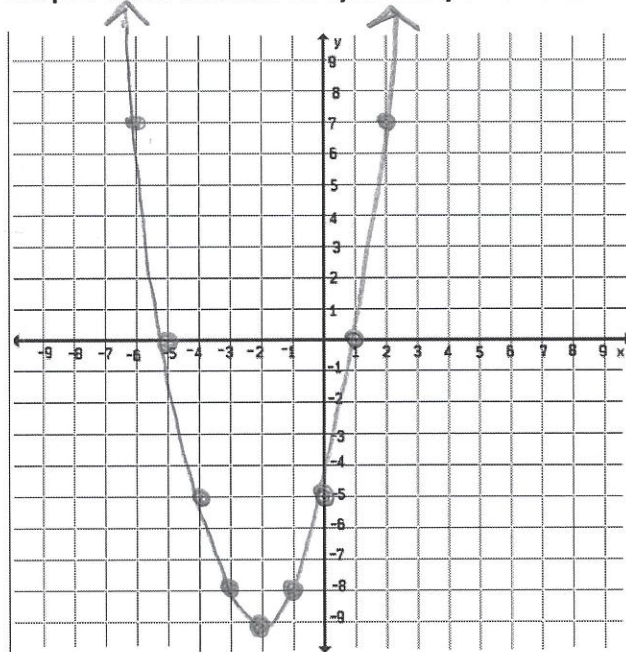
Coordinates of Vertex:

$(-2, -9)$

Table of Values:

x	y
0	-5
-1	-8
-2	-9
-3	-8
-4	-5
-5	0

Graph. Label the axis of symmetry and vertex.



What are the zero(s) of the function?

$x = -5$ OR $x = -1$

Is the vertex a maximum or a minimum?

minimum

State the Domain

all real numbers

State the Range

$y \geq -9$

2. $f(x) = -2x^2 + 12x - 10$

$a = -2$ $b = 12$ $c = -10$

Is the graph of $y = f(x)$ concave up or concave down? How do you know?

Concave down b/c a is negative $a < 0$

Equation for Axis of Symmetry:

$$x = \frac{-b}{2a} \quad x = \frac{-(12)}{2(-2)} \quad \frac{-12}{-4}$$

$$x = 3$$

Coordinates of Vertex:

$$f(3) = -2(3)^2 + 12(3) - 10$$

$$f(3) = -18 + 36 - 10$$

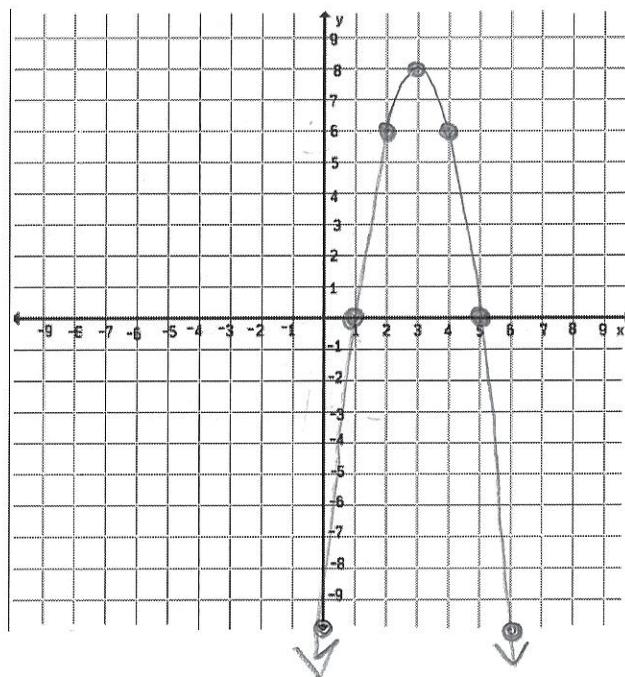
$$f(3) = 8$$

$$(3, 8)$$

Table of Values:

x	y
1	0
2	6
3	8
4	6
5	0

Graph. Label the axis of symmetry and vertex.



What are the zero(s) of the function?

$$x = 1 \text{ OR } x = 5$$

Is the vertex a maximum or a minimum?

maximum

State the Domain

all real numbers

State the Range

$$y \leq 8$$

* vertex form

$$f(x) = +/- a(x-h)^2 - k$$

3. The height (in feet) of an object shot into the air after t seconds is modeled by the function

$$h(t) = -16(t - 2.3)^2 + 178$$

State the Function Type and Shape:

Quadratic Function U-shape

State the vertex: $(2.3, 178)$

State the concavity: Concave down b/c a is negative

A. Determine the amount of time it took the object to reach its maximum height.

Include Units of Measure

$$t = 2.3 \text{ seconds}$$

B. Determine the maximum height of the object in flight.

Include Units of Measure

$$h = 178 \text{ feet}$$

C. What was the height of the object the instant it was fired?

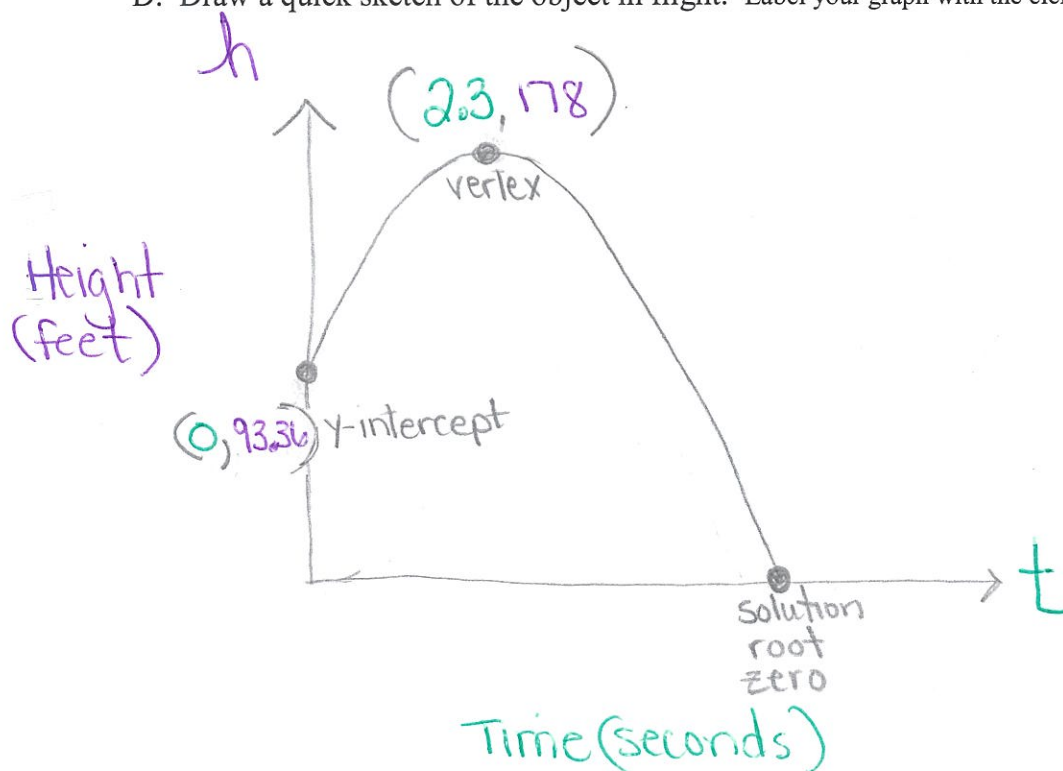
* y-intercept

Include Units of Measure

$$h(0) = -16(0 - 2.3)^2 + 178$$

$$h(0) = 93.36 \text{ feet}$$

D. Draw a quick sketch of the object in flight. Label your graph with the elements from parts A, B, and C



*Standard Form

4. The height (in feet) of a ball kicked in the air after t seconds is modeled by the function
 $h(t) = -16t^2 + 48t + 1.75$ $a = -16$ $b = 48$ $c = 1.75$

STATE THE VERTEX:

$$x = \frac{-b}{2(a)} = \frac{-(48)}{2(-16)} = \frac{-48}{-32} = \frac{3}{2}$$

$$\boxed{1.5}$$

$$h(1.5) = -16(1.5)^2 + 48(1.5) + 1.75$$

$$= -36 + 72 + 1.75$$

$$h(1.5) = 37.75$$

vertex

$$\boxed{(1.5, 37.75)}$$

ROUND ANSWERS TO THE NEAREST HUNDREDTHS AND INCLUDE UNITS OF MEASURE.

A. Determine the height of the ball after $t = 1.68$ seconds. *Include Units*

$$h(1.68) = -16(1.68)^2 + 48(1.68) + 1.75$$

$$h(1.68) = \boxed{37.23 \text{ feet}}$$

B. Determine the amount of time it took the ball to reach its maximum height. *Include Units*

$$t = \boxed{1.5 \text{ seconds}}$$

C. Determine the maximum height of the ball in flight. *Include Units*

$$h = \boxed{37.75 \text{ feet}}$$

D. Determine how long it took for the ball to reach the ground. *Include Units*

$$t = \frac{-(-48) \pm \sqrt{(-48)^2 - 4(-16)(1.75)}}{2(-16)}$$

$$t = \frac{-48 \pm \sqrt{2416}}{-32}$$

$$t = \frac{-48 \pm 49.15}{-32} \leftarrow \text{rounded to hundredths}$$

$$t = \frac{-48 + 49.15}{-32}$$

$$t = \frac{-48 - 49.15}{-32}$$

$$t = \frac{1.15}{-32}$$

$$t = \frac{-97.15}{-32}$$

$$\boxed{t = -0.04}$$

OR

$$\boxed{t = 3.04 \text{ seconds}}$$

no such thing
as negative time

E. Draw a quick sketch of the ball in flight. Label key points.

