

NAME:

DATE:

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

DAY G2

(GRAPHING AND ANALYSIS)

NOTES

vertex form $f(x) = +/- a(x-h) + k$

1. The height (in feet) of a cornhole bag thrown in the air after t seconds is modeled by the function $h(t) = -16(t-1.45)^2 + 37.64$

State the Function Type and Shape: Quadratic Function U-shape

State the vertex: $(1.45, 37.64)$

State the concavity: Concave down b/c $-16 < 0$

- A. Determine the amount of time it took the cornhole bag to reach its maximum height.

Include Units of Measure

$$t = 1.45 \text{ seconds}$$

- B. Determine the maximum height of the cornhole bag in flight.

Include Units of Measure

$$h = 37.64 \text{ feet}$$

- C. What was the height of the cornhole bag the instant it was released?

★ y-intercept

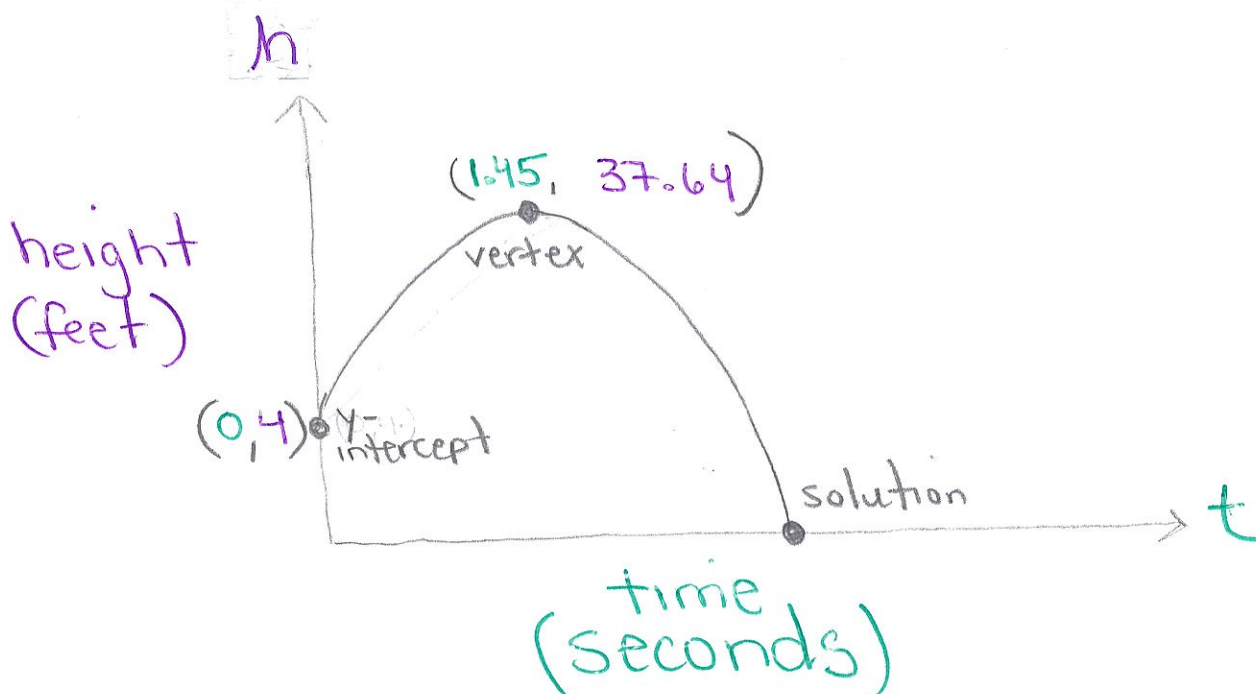
Include Units of Measure

$$h(0) = -16(0-1.45)^2 + 37.64$$

$$h(0) = 4$$

4 feet

- D. Draw a quick sketch of the cornhole bag in flight. Label key points.



standard form

2. The height (in feet) of a ball kicked in the air after t seconds is modeled by the function

$$h(t) = -16t^2 + 80t + 2 \quad a = -16 \quad b = 80 \quad c = 2$$

STATE THE VERTEX:

$$x = \frac{-b}{2a} \quad x = \frac{-(80)}{2(-16)}$$

$$x = \frac{-80}{-32}$$

$$t = 2.5$$

$$h(2.5) = -16(2.5)^2 + 80(2.5) + 2$$

$$= -100 + 200 + 2$$

$$h(2.5) = 102$$

$$(2.5, 102)$$

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

A. Determine the height of the ball after $t = 1.2$ seconds. Include Units

$$h(1.2) = -16(1.2)^2 + 80(1.2) + 2$$

$$= -23.04 + 96 + 2$$

$$h(1.2) = 74.96 \text{ feet}$$

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

$$2.5 \text{ seconds}$$

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

$$102 \text{ feet}$$

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

This is asking for the solution.
Use the formula.

$$t = \frac{-(80) \pm \sqrt{(80)^2 - 4(-16)(2)}}{2(-16)}$$

$$t = \frac{-80 \pm \sqrt{6528}}{-32}$$

$$t = \frac{-80 \pm 80.80}{-32} \quad \leftarrow \text{round to hundredths}$$

$$t = \frac{-80 + 80.80}{-32} \quad \text{OR} \quad t = \frac{-80 - 80.80}{-32}$$

$$t = \frac{0.80}{-32} \quad \text{OR} \quad t = \frac{-160.80}{-32}$$

$$t = -0.03 \quad \text{OR} \quad t = 5.03 \text{ seconds}$$

no negative time

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

