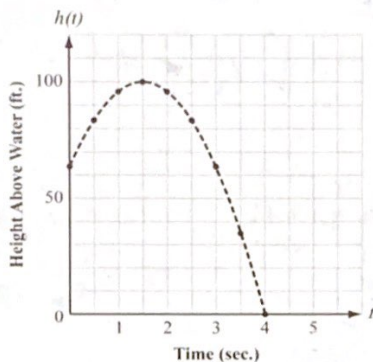


Name: Ken

Date: _____

Quadratics Modeled in the Real World

Philip is standing on a rock ledge 64 feet above a lake, and he tosses a rock with a velocity of 48 feet per second. This graph and table represent the height above the water, $h(t)$, as a function of time, t , in seconds after Philip releases the rock.



Time t	Height $h(t)$
0	64
1	96
2	96
3	64
4	0

1. What is the maximum height of the rock?

100 ft

2. After how many seconds does the rock change direction in the air?

1.5 sec

3. When does the rock hit the surface of the lake? 4 sec

What is this point on the graph called?

zero/solution/x int / root

How can you identify this from the table?

when $y = 0$

4. Identify the vertex and the axis of symmetry.

Vertex: (1.5, 100)

A of S: $x = 1.5$

What do these represent in our story?

where the rock changes directions

5. At 1 sec, what direction is the rock moving?

UP

At 2 sec, what direction is the rock moving?

down

Philip is standing on a rock ledge 64 feet about a lake, and he tosses a rock with a velocity of 48 feet per second. $h(t) = -16t^2 + 48t + 64$

6. Will this graph open up or down? *down*
Will the vertex be a maximum or a minimum? Why?

*maximum, graph faces down
a negative "a" value*



7. Using your standard form equation from #1, write the equation in vertex form (decimals are ok).

a: -16 $x = \frac{-48}{2(-16)} = \frac{-48}{-32} = \boxed{1.5}$
b: 48
c: 64 $y = \boxed{100}$

$y = -16(x - 1.5)^2 + 100$

8. Using the equation from ^{#7}~~#2~~, what is the maximum height the rock reaches above the surface of the lake? How did you get this answer?

100 ft

9. Using the equation from ^{#7}~~#9~~, after how many seconds did the rock change direction in the air? How did you get this answer?

1.5 sec. axis of symmetry

10. At 1 sec, what direction is the rock moving?

up

- At 2 sec, what direction is the rock moving?

down