

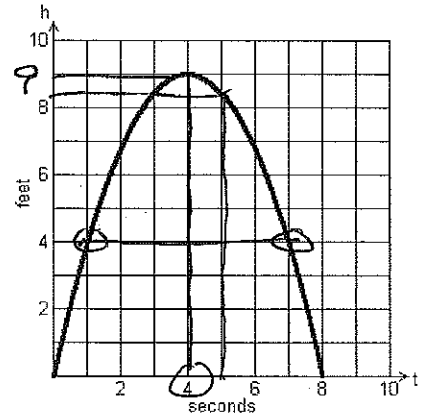
Graphing Quadratic Functions

Example #1

Interpret the following situation.

Jan threw a ball straight up into the air. The graph to the right represents the height (h) of the ball at time (t).

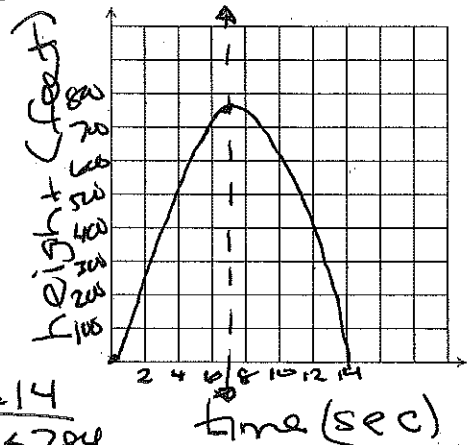
- a) When is the ball on the ground? 0 sec, 8 sec
- b) What is the maximum height of the ball?
9 feet
- c) When is the ball at its highest? 4 sec
time
- d) When is the height of the ball 4 feet? 1 sec & 7 sec
- e) Approximate the height of the ball at 5 seconds.
8.5 feet
- f) Is the graph a function? If it is a function, find the domain and the range. Domain: $0 \leq x \leq 8$
yes Range: $0 \leq y \leq 9$



Example #2

A rocket is launched from ground level with an initial velocity of 224 ft/s. The height h in feet of the rocket at any given time t in seconds is $h(t) = 224t - 16t^2$. \rightarrow $h(t) = -16t^2 + 224t$

- table
- a) When will the rocket reach a height of 528 feet?
3 seconds
 - b) When will the rocket reach the ground?
14 seconds
 - c) When will the rocket reach its maximum height?
7 seconds
 - d) What is the maximum height of the rocket?
784 feet
 - e) Graph this situation.
 - f) State the domain and range of the graph.
Domain: $0 \leq x \leq 14$
Range: $0 \leq y \leq 784$

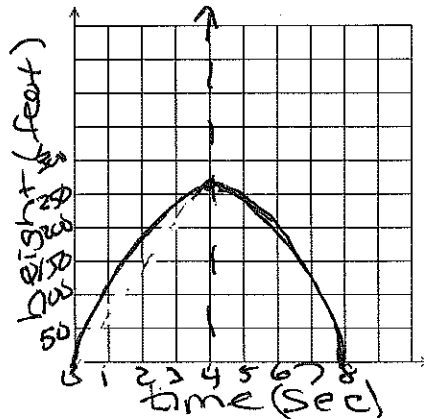


$$x = \frac{-b}{2a} = \frac{-224}{2(-16)} = 7$$

POSS $x = 7$

1. An object is hurled upward from the ground at an initial velocity of 128 ft/s. The height h in feet of the object at any given time t in seconds is $h(t) = 128t - 16t^2$.

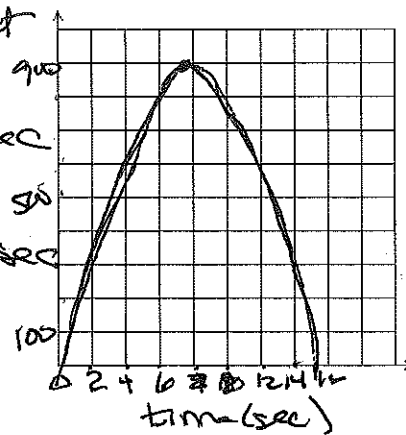
- a) When will the object reach a height of 192 feet?
At 2 seconds & 6 seconds
- b) When will the object reach the ground?
After 8 seconds
- c) When will the object reach its maximum height?
At 4 seconds
- d) What is the maximum height of the object?
256 feet
- e) Graph this situation.
- f) State the domain and the range of the graph.



Domain: $0 \leq x \leq 8$
Range: $0 \leq y \leq 256$

2. From ground level, an object travels upward with an initial velocity of 240 ft/s. The height h in feet of the object at any given time t in seconds is $h(t) = 240t - 16t^2$.

- a) Find $h(1)$. Explain the meaning of this question in the context of this problem.
After 1 second the height is 224 feet
- b) Find the value of t when $h(t) = 800$. Explain the meaning of this question in the context of this problem.
The object reaches 800 ft at 5 & 10 sec
- c) Find the value of t when $h(t) = 0$. Explain the meaning of this question in the context of this problem.
The object reaches the ground after 15 sec
- d) When will the object reach its maximum height?
At 7.5 seconds
- e) What is the maximum height of the object?
900 feet
- f) Graph this situation.
- g) State the domain and the range of the graph.



Sec) Domain: $0 \leq x \leq 15$
feet) Range: $0 \leq y \leq 900$

$$x = \frac{-b}{2a} = \frac{-240}{2(-16)} = 7.5$$