

Name: Key Period: _____

Imagine that you shoot a basketball from a height of 6 feet with an upward velocity of 72 feet per second.

Impressive!

How far is the ball from the ground at the moment you launch it?

6 feet

How far is the ball from the ground after 1 second?

78 feet

How far is the ball from the ground after 4 seconds?

294 feet

Create a model to describe the height of the ball.

$$f(x) = 6 + 72x$$

Use your model to find the height of the ball after 10 seconds.

$$\begin{aligned} f(10) &= 6 + 72(10) \\ &= \boxed{726 \text{ feet}} \end{aligned} \quad \text{Wow!}$$

What is going on here?

I think something was left out...

Turn the page to find out if we agree.



Add the effects of gravity to your model

$$y = -16x^2 + 72x + 6$$

Quadratic Term
acceleration due to gravity

Linear Term
initial velocity

Constant
initial height

How far is the ball from the ground at the moment you launch it?

6 feet

How far is the ball from the ground after 1 second?

62 feet

How far is the ball from the ground after 2 seconds?

86 feet

How far is the ball from the ground after 3 seconds?

78 feet

How far is the ball from the ground after 4 seconds?

38 feet

How far is the ball from the ground after 10 seconds?

$$f(10) = -16(10^2) + 72(10) + 6$$

$$= \boxed{-874 \text{ ft.}}$$

Really? Let's talk about this.

x	y
0	6
1	62
2	86
3	78
4	38
5	-34
6	-138

