

"Rates of Change" with a Baseball on Earth and the Moon

1) On Earth, you can throw a baseball 64 feet straight up into the air. In  $t$  seconds after throwing, the ball is  $s = 64t - 16t^2$  feet above your hand.

a) Use parametric mode on your calculator to simulate the position of the baseball.

b) How long does it take the ball to reach its maximum height?

c) With what velocity does it leave your hand?

d) On the moon, the same force would send the ball a height of  $s(t) = 64t - 2.6t^2$  feet in  $t$  seconds. About how long will it take the ball to reach its maximum height, and how high will it go?

e) How long does it take for the baseball to reach  $\frac{1}{2}$  of its maximum height on the moon?

f) Find the acceleration due to gravity on earth and on the moon in feet/sec<sup>2</sup>.