

MCS-121

Antiderivatives and Initial Value Problems

1. The acceleration due to gravity on planet Gack is not constant. Instead, the acceleration is given by the following function:

$$a(t) = -e^t \text{ ft/sec}^2.$$

A chocolate covered espresso bean is thrown vertically upward with an initial velocity of 30 ft/sec from a height of 100 ft.

- (a) Find equations for $v(t)$ and $s(t)$.
- (b) When does the bean hit the ground?
- (c) How fast is it going when it hits the ground?

2. Back on earth a beanie baby was dropped off a cliff and hit the ground with a speed of 120 ft/s. What was the height of the cliff?