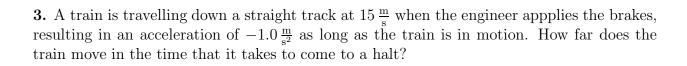
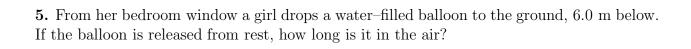
Phys 2010 (NSCC), Fall 2006 Problem Set #3

1. A cart rolling down an inclined track starts from rest and accelerates at $3.30 \frac{m}{s^2}$. At 1.2 s, how far has it rolled down the slope and what is its speed?

2. What is the acceleration of a cart rolling down a slope if it starts from rest and rolls $2.0~\mathrm{m}$ in $1.35~\mathrm{s}$?



4. If we drop a rock, how far does it fall in 5.0 s? What is its speed at that time?



6. A rock is thrown straight upward from ground level; it reaches a maximum height of 65.0 m. (a) What was the initial speed of the rock? (b) How long did it take to get to maximum height?

7. A rock is thrown straight downward from a height of 50.0 m with an initial speed of $10.0\frac{\text{m}}{\text{s}}$. What is its speed when it reaches the ground? (Be careful; the initial velocity is $-10.0\frac{\text{m}}{\text{s}}$.)

8. A particle moving in two dimensions has an initial velocity in the +x direction, with initial speed $20.0 \frac{\text{m}}{\text{s}}$ (so $v_{0x} = 20.0 \frac{\text{m}}{\text{s}}$, $v_{0y} = 0$). It undergoes a constant acceleration with $a_x = 0$ and $a_y = -6.0 \frac{\text{m}}{\text{s}^2}$. What is the speed of the particle at t = 4.0 s?

(Recall the definition of speed: $v = \sqrt{v_x^2 + v_y^2}$.)