HW 8: Section 5.5

Due: Thursday, October 3rd in SQRC by 9pm

Learning Goals:

- Reason about problems involving projectile motion.
- Explore how awesome math is (optional but recommended).

Questions:

1. A diver drops from 120 feet above the water (about the height of divers at the Acapulco Cliff Diving competition). Ignoring air resistance, what is the diver's velocity at impact?

2. A plane at an altitude of 256 feet wants to drop supplies to a specific location on the ground. If the plane has a horizontal velocity of 100 ft/s, how far away from the target should the plane release the supplies in order to hit the target location?

3. A piece of bread with jelly is dropped from a height of 100 feet. A piece of bread with peanut butter directly below the first is launched vertically from the ground with initial velocity 40 ft/s. Determine when and how high up the sandwich is formed.

4. (optional, not graded) This is just for fun. First make a mobius strip. You can do this by cutting a long thin strip of paper, then taping it to itself with a half twist in it. If you use tape make sure to securely tape it all the way around the point of contact, not just one little piece of tape.

   a) How many sides does the mobius strip have? If you are confused try coloring them. How many edges does it have? If you are confused try marking your starting point with a paperclip and then tracing your finger along the edge.

   b) Cut the mobius strip in half by cutting down the middle of the strip lengthwise (so not the way you just taped it shut). What are you going to get from cutting it this way?

   c) Now cut it into thirds. So as you cut, keep your scissors about one third away from the edge. What will you get this time?