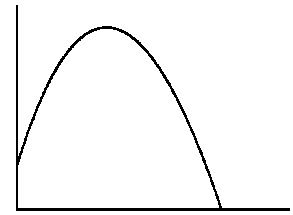


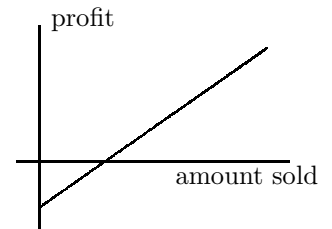
1. The graph to the right indicates *height* of a cannonball over time.

- a) Label the two axes. Which is height and which is time? How do you know?
- b) If labels were added to this graph indicating units, would it be possible to tell how far the cannonball traveled from this information? Why or why not?
- c) The curve shown does not go through the intersection of the two axes. What does this mean (about the cannonball)?



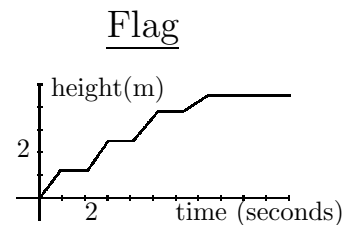
2. Sally and Charlie are planning to have a lemonade stand in their driveway. Part of the business proposal they present to their parents includes the graph to the right.

- a) What is the meaning of the point where the graph crosses the horizontal axis?
- b) What is the meaning of the slope (steepness) of the graph?
- c) What is the meaning of the point where the graph intersects the vertical axis?

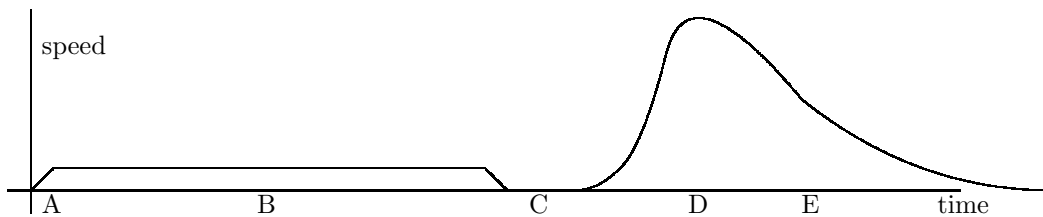


3. Refer to the graph to the right labeled “Flag”.

- a) What is happening to the flag? (Explain in the features of the graph.)
- b) How tall is the flagpole?



4. The graph below is based on data collected at a hill where a child is sledding. Describe the sledder’s journey by saying what is happening at and each labeled times on the graph. (Be sure to note the axis labels.)



5. Political scientists have found that  $f(x) = \frac{x}{x^3 + (1 - x)^3}$  is a good model for the percentage of seats in the House of Representatives that will be held by Democrats if  $x$  is the portion of the population that claims to favor Democrats.

- a) The domain for this function is the interval  $[0, 1]$ , why?
- b)  $f(.6) = .77$  (Check it out on your calculator.) What does this mean?
- c) Calculate values of  $f$  for several values of  $x$ . (Record them on a piece of paper as you calculate them.) How do  $x$  and  $f(x)$  compare when  $x > \frac{1}{2}$ ? How do  $x$  and  $f(x)$  compare when  $x < \frac{1}{2}$ ? Explain why this is a good feature of the model.
- d) Use the values you just computed to sketch the graph of  $f$ . (Compare with a graph on your calculator if you like.)
- e) Use algebra to show a general relationship between  $f(x)$  and  $f(1 - x)$ . What does this say about the model? (Hint: Start by considering  $f(.6)$  and  $f(.4)$  and another example of your choosing.)
- f) In the United States, at the national level we pretty much have a two-party system. Show that this model is probably not very good for modeling a three-party system by creating an example with three parties and seeing what the model predicts.