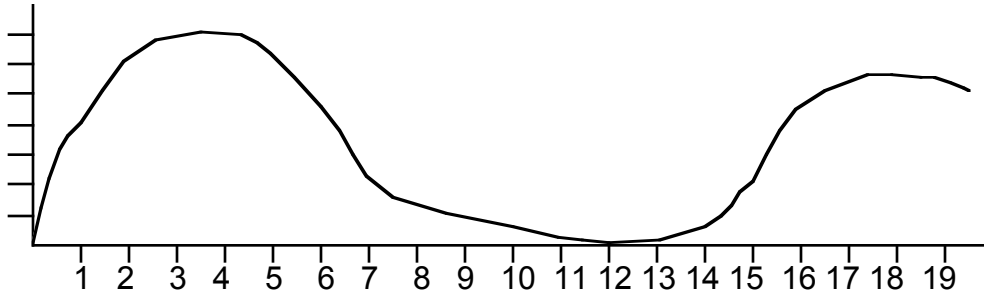


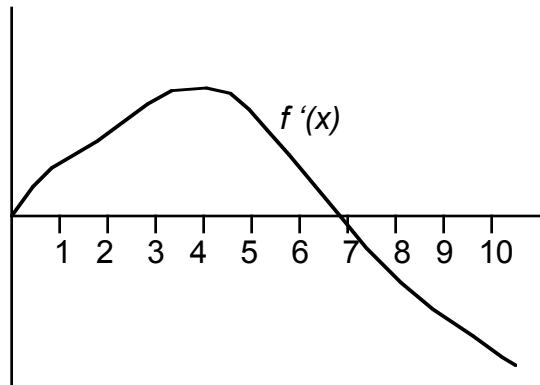
1. In the graph below the position of a particle moving along a line is shown.



- a) At what times is the particle's velocity equal to zero?
- b) At what times is the particle's acceleration equal to zero?
- c) During what range of time does the particle have positive velocity with negative acceleration?

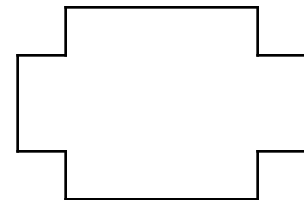
2. Shown at right is a graph of the DERIVATIVE of f .

- a) Over what interval is f increasing?
- b) Where does f have its maximum value?
- c) Where does f have an inflection point?
- d) Where is f concave down?
- e) Sketch f on the same axes.



3. A rectangular plot of farmland will be bounded on one side by a river and on the other three sides by fencing. You have a total of 800m of fencing at your disposal. What is the largest area that can be fenced?

4. You are planning to make an open rectangular box from an 8 in. x 15 in. piece of cardboard by cutting congruent squares from the corners and folding up the sides. What are the dimensions of the box of largest volume, and what is its volume?



5. Evaluate first and second derivatives, sketch, verify:

a) $f(x) = \ln(x) + \frac{1}{x}$

b) $f(x) = \sqrt{x} - x$