1 Stewart, section 5.3: #3, 9, 15, 17, 21, 25, 43, 51, 53, 58, 63, 74

2 Stewart, section 5.4: #3, 9, 15, 27, 35, 36, 47, 49, 57, 60

3 Stewart, section 5.5: #9, 11, 17, 21, 39, 46, 53, 59, 65, 73, 80, 81

4 The acceleration due to gravity on Earth is 32 ft/sec^2. A tomato is dropped from 100 feet above the ground.

a) At what speed does the tomato hit the ground?

b) How long does it take to travel the last 10 feet?

5 The graph of a function f (Figure 1) consists of a line segment, a circle, and then two more line segments. Let g be the function given by $g(x) = \int_0^x f(t)\,dt$.

a) $g(2) =$ _____ $g(4) =$ _____ $g(5) =$ _____
$g(6) =$ _____ $g(6.1) =$ _____

b) $f'(6) =$ _____ $g'(6) =$ _____

c) $f'(3) =$ _____ $g'(3) =$ _____

d) Find all values of x on the interval $(0, 6)$ at which g has a relative maximum. It may help to sketch a graph of $g(x)$.

e) Find all values of x on the interval $(0, 6)$ at which g has a relative minimum.

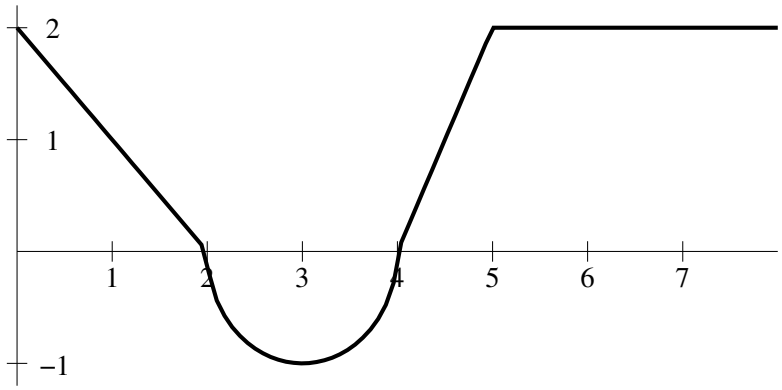

Figure 1: f(x)

6 Suppose you look out the window of a skyscraper and see someone throw a tomato downward. Your window is at a height of 450 ft. The tomato passes your window after 2 seconds and hits the ground after 5 seconds (from the time it was thrown). Find the velocity at which the tomato was thrown down, and also the height from which it was thrown. (Neglect air resistance).

7 Same as problem 6, except that you did not see the moment when the tomato was dropped. However, in this problem you know that it fell from rest (ie: $v_0 = 0$) and this time you measure exactly 2 seconds between the time the tomato passes your window (still at a height of 450 feet) and the time it hits the ground. From what height did it fall?

8 At time $t = 0$ seconds, an object is tossed straight up. The upward velocity of the object is shown in Figure 2. Use the information provided to answer the following questions.

a) What was the initial upward velocity of the object (include units)? _____

b) At $t = 2$ seconds, the object is _____ feet _____ (above or below) its starting point.

c) At $t = 4$ seconds, the object is _____ feet _____ (above or below) its starting point.

d) How far did the object travel during its first 7 seconds?

e) How far from its starting location is the object after 7 seconds?

f) Sketch a graph of $h(t)$, the elevation of the object at time t.

g) What kind of object (and situation) might lead to this velocity graph?

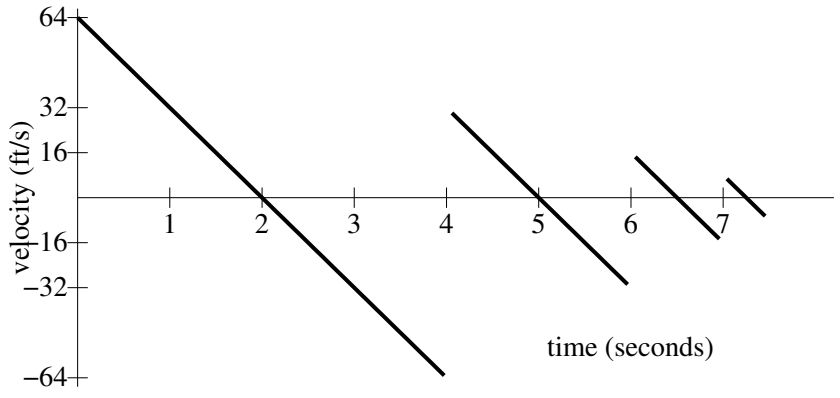

Figure 2: velocity graph of the object