7. [12 points] In each of the following questions, sketch a well-labeled graph that satisfies the given conditions. You do not need to explain your answer, but you should label any relevant features of your graph. Each part of this problem is independent of the others and there may be many correct solutions.

a. [3 points] Sketch the graph of a function $f(x)$ so that $\int_0^{10} f(x)dx = 0$ and $f(0) > 0$.

b. [3 points] Sketch the graph of a function $v(t)$ giving the velocity in ft/sec of a bird at time t seconds, assuming it leaps upward from the ground at an initial velocity of 10 ft/sec at time $t = 0$ and hovers momentarily at a height of 2 feet before falling back to the ground. Positive velocities should indicate upward motion of the bird, and you should label the aspects of your graph that correspond to each of the given quantities.

c. [3 points] On a single set of axes, sketch the graphs of functions $C(q)$ giving the cost of producing q units of a good and the revenue $R(q)$ obtained by selling q units. Assume that fixed costs are $100 and the item is sold for $10 per unit.

d. [3 points] On a single set of axes, sketch the graphs of marginal cost $MC(q)$ and marginal revenue $MR(q)$ functions so that profit is maximized at $q = 50$ units.