Essentials of Calculus

Homework 5.1

Velocity and distance

1. In t minutes, a snail's velocity will be $f(t) = 3 + 2t^2$ inches/min. Use a Riemann sum with $n = 4$ and left endpoints to approximate how far the snail travels in the next 2 minutes. (Note that $\Delta t = 1/2$.)

2. In t hours, water is poured into a pool at a rate of $f(t) = 30 + 10t^2$ gallons/hour. Use a Riemann sum with $n = 4$ and right endpoints to approximate how much water is poured into the tank in the next 1 hour.

3. The velocity of a car in t hours is given by the following table.

t (hours)	0	2	4	6	8
$f(t)$ (mile/hour)	50	70	100	120	140

   a) Use left endpoints to approximate the distance traveled over the next 8 hours.

   b) Use right endpoints to approximate the distance traveled over the next 8 hours.

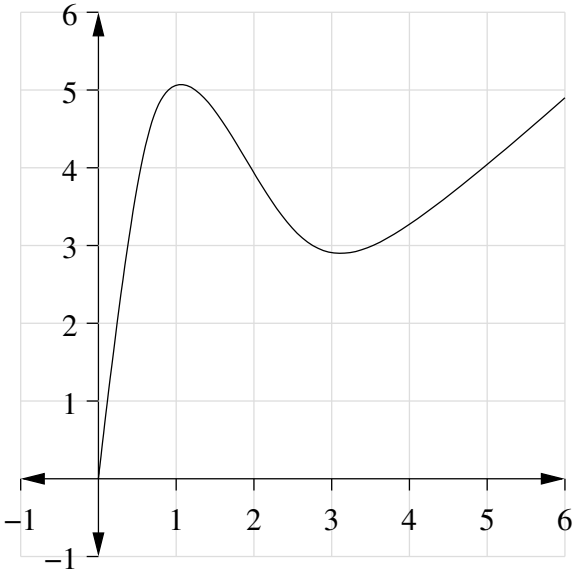
4. The rate at which a mutant spider gains weight is given by the following table.

t (minutes)	0	15	30	45	60
$f(t)$ (kg/minute)	1	2	5	10	14

   a) Use left endpoints to approximate the weight gained over the next 60 minutes.

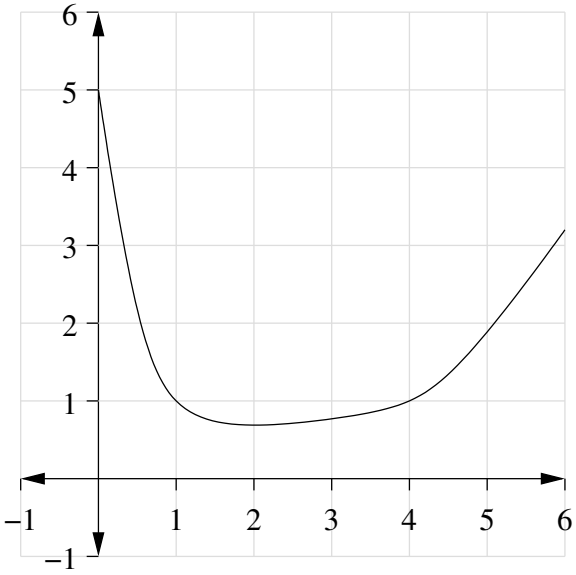
   b) Use right endpoints to approximate the weight gained over the next 60 minutes.

5. Let f be the function with the following graph:



Use a Riemann sum with $\Delta x = 1$ to approximate the area under the graph. (Use either left or right endpoints.)

6. Let f be the function with the following graph:



Use a Riemann sum with $\Delta x = 1$ to approximate the area under the graph. (Use either left or right endpoints.)