Math 261 - Activity 2 **Name:** _____

1. Let $f(x) = 4 - x^2$

   (a) Graph $f(x)$ on the interval $[-2, 2]$

   (b) Find approximations of the area between $f(x)$ and the x-axis using each of the following:

      i. A Lower sum with 2 rectangles of equal width.

      ii. A Midpoint sum with 2 rectangles of equal width.

      iii. A Right hand sum with 2 rectangles of equal width.

      iv. A left hand sum with 4 rectangle of equal width.

      v. An upper sum with 4 rectangles of equal width.

      vi. A Midpoint sum with 4 rectangles of equal width.

2. The following table gives data for the velocity of a vintage sports car accelerating from 0 to 142 miles per hour in 36 seconds (10 thousands of an hour).

Time (in hrs)	0.0	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.010
Velocity (in mph)	0	40	62	82	96	108	116	125	132	137	142

(a) Use rectangles to estimate how far the car traveled during the 36 seconds it took to reach 142 miles per hour.

(b) Roughly how many seconds did it take for the car to reach the halfway point in its journey? About how fast was the car going then?

3. Let $f(x) = \frac{1}{x}$ on $[0, 9]$. Use a finite sum to estimate the average value of $f(x)$ on this interval by using the Midpoint Rule with four subintervals of equal length.