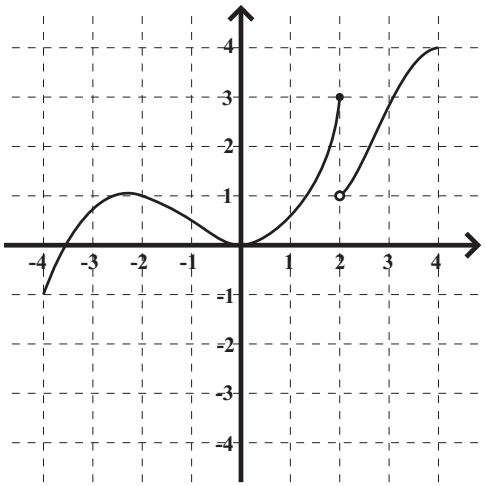
Math 151
Exploring Integrals

1. Let $f(x) = x^2 - 3$. Compute the Riemann sum on the interval $[-2, 10]$...
   (a) ... with 3 pieces and midpoints.
   (b) ... with 4 pieces and right endpoints.

2. For the function graphed below, give the Riemann sums using left endpoints and using right endpoints with four equal subintervals.



3. Suppose a car is decelerating from a velocity of 120 ft/sec at 20 ft/sec^2. How far does the car travel before coming to a full stop?

4. Compute the following.
   (a) $\int (x^4 - 2x^2 + 1)\, dx$
   (b) $\int \cos 3\theta \, d\theta$
   (c) $\int_{-1}^{8} \sqrt[3]{t}\, dt$
   (d) $\int_{-3}^{3} x^3 \, dx$
   (e) $\frac{d}{dx}\int_{3}^{x} \sec t \, dt$
   (f) $\frac{d}{dx}\int_{3}^{x^2} \sec t \, dt$

   Hint. What is $\frac{d}{dy}\int_{3}^{y} \sec t \, dt$?