1. Find the area of the region bounded by the curve which is the graph of $f(x) = x^2 - 10x$, the $x$-axis, and both the lines $x = 2$ and $x = 8$.

2. Set up the integral which when evaluated will equal to the area of the region bounded by the curve which is the graph of $f(x) = x^2 - 6x$, the $x$ axis, the $y$ axis, and the line $x = 9$. Note that this region has two parts.

3. Evaluate the following definite integrals
   a) $\int_0^2 (x^2 - 8x - 4)\, dx$
   b) $\int_{\pi/4}^{\pi/2} (\sin x)\, dx$
   c) $\int_0^1 \frac{dx}{1 + x^2}$
   d) $\int_2^4 \frac{dx}{x}$
5814 Simple Volume by Disks

1. Find the volume of the solid obtained by rotating about the $x$ axis the region bounded by the curve $y = 10x - x^2$ and the $x$ axis.

2. Find the volume of the solid generated by rotating about the $x$ axis the region bounded by the parabola $y = 6x - x^2$ and the line $y = 2x$.

3. Find each of the following antiderivatives by making an appropriate substitution. In order to do this we set $u(x)$ equal to some function of $x$.
   a) $\int (x + 6) \sqrt{x^2 + 12x + 24} \, dx$
   
   b) $\int \sqrt{4 + \sin(5x) \cos(5x)} \, dx$

   c) $\int \frac{4x + 14}{x^2 + 7x} \, dx$ for $x \geq 1$
5815 Properties of the Definite Integral

1. Given that $\int_{1}^{3} f(x)dx = 6$, $\int_{1}^{3} g(x)dx = 9$, $\int_{3}^{10} f(x)dx = 25$, $\int_{3}^{10} g(x)dx = 20$, $\int_{3}^{5} f(x)dx = 11$, and $\int_{3}^{5} g(x)dx = 8$. Find the value of each of the following integrals:
   a) $\int_{3}^{10} [8f(x) - 5g(x)]dx$  
   b) $\int_{1}^{10} f(x)dx$

   c) $\int_{5}^{10} f(x)dx$  
   d) $\int_{5}^{10} [6f(x) - 4g(x)]dx$

2. A graph of $f(x)$ for $0 \leq x \leq 7$ is given. Recall that $\int_{a}^{b} f(x)dx$ is the same number as the area of the region bounded by the curve $y = f(x)$, the lines $x = a$ and $x = b$, and the $x$-axis. Use this fact to evaluate the following integrals. Hint: In order to find area divide the figure into rectangles and triangles.
   a) $\int_{1}^{3} f(x)dx$  
   b) $\int_{1}^{5} f(x)dx$

   c) $\int_{1}^{4} f(x)dx$  
   d) $\int_{3}^{7} f(x)dx$

   e) $\int_{1}^{6} f(x)dx$  
   f) $\int_{4}^{7} f(x)dx$
1. A particle is moving along a straight line with velocity given by \( v(t) = 16t^2 - 24t + 14 \) ft/sec. Find the displacement or change of position of the particle during the time interval \( 1 \leq t \leq 5 \). Note that \( v(t) > 0 \).

2. There are two parts to the region bounded by the curve \( y = x^2 - 5x \), the x axis, and the line \( x = 8 \). Find the total area of this region.

3. Find the antiderivative \( \int [10 + 4f(x)]^3 f'(x) \, dx \).

4. Find the antiderivative \( \int \frac{3x + 5}{6x^2 + 20x + 10} \, dx \).

5. Find the antiderivative \( \int \sin[3f(x)] f'(x) \, dx \).