MATH 230 NAME:
5.1

Directions: Show all work on a separate sheet of paper for full credit.

1. Sketch the region enclosed the the given curves and find its area.

   (a) $y = 12 - x^2$ and $y = x^2 - 6$ $\int_{-3}^{3}(18 - x^2) - (x^2 - 6)\, dx = 72$

   (b) $y = \sqrt{x-1}$, $x - y = 1$ $\int_{1}^{2} \sqrt{x-1} - (x-1)\, dx = 1/6$

   (c) $y = \cos(x)$ and $y = 2 - \cos(x)$ for $0 \leq x \leq 2\pi$ $\int_{0}^{2\pi} 2 - 2\cos(x)\, dx = 4\pi$

   (d) $x = y^2 - 1$, $x = \sqrt{y}$, $y = 0$, and $y = 1$ $\int_{0}^{1} \sqrt{y} - (y^2 - 1)\, dx = 4/3$

   (e) $y = x^4$ and $y = 2 - |x|$ $\int_{-1}^{0}(2 + x) - x^4\, dx + \int_{0}^{1}(2 - x) - x^4\, dx = 13/5$

2. Find the area of the triangle with the given vertices: (0,0), (3,1), and (1,2).

$$\int_{0}^{1}(2x - x/3)\, dx + \int_{1}^{3}(-x/2 + 5/2) - x/3\, dx = 5/2$$