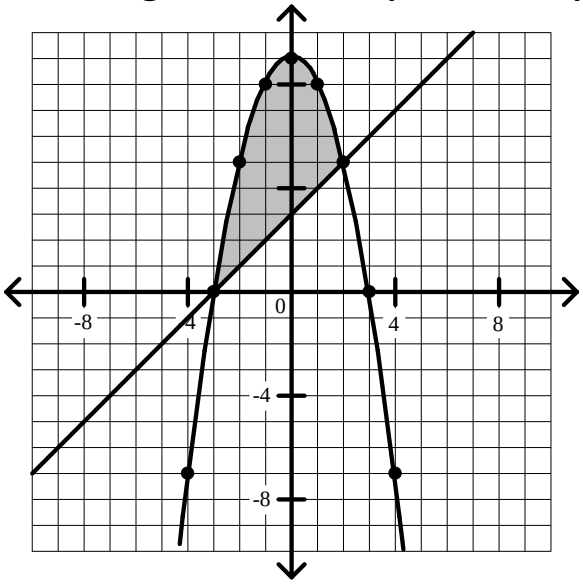
Calculus Worksheet #6 Unit 3 Selected Solutions

2. the region bounded by the curve $y = 9 - x^2$ and the line $y = x + 3$



$$A = \int_{-3}^{2} [(9 - x^2) - (x + 3)]\, dx =$$

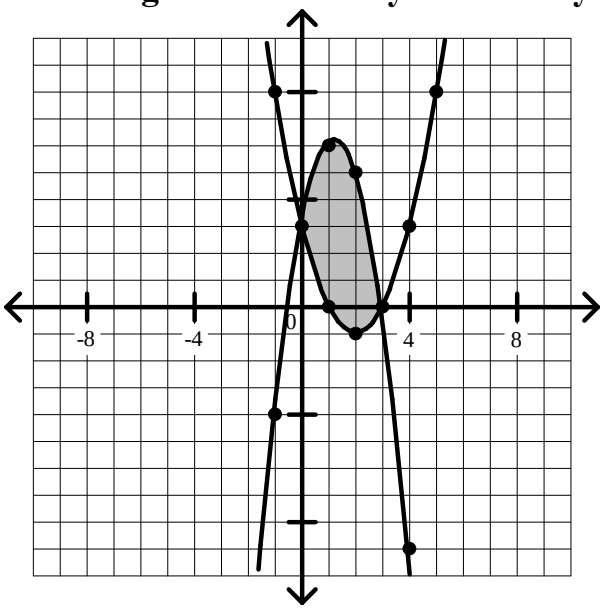
$$A = \int_{-3}^{2} (6 - x - x^2)\, dx = \left(6x - \frac{1}{2}x^2 - \frac{1}{3}x^3\right)\Big|_{-3}^{2} =$$

$$A = \left(12 - 2 - \frac{8}{3}\right) - \left(-18 - \frac{9}{2} + 9\right) =$$

$$A = \frac{22}{3} - \frac{-27}{2} =$$

$$A = \frac{125}{6} \text{ square units}$$

5. the region bounded by the curve $y = x^2 - 4x + 3$ and the curve $y = -2x^2 + 5x + 3$



$$A = \int_{0}^{3} [(-2x^2 + 5x + 3) - (x^2 - 4x + 3)]\, dx =$$

$$A = \int_{0}^{3} (-3x^2 + 9x)\, dx = \left(-x^3 + \frac{9}{2}x^2\right)\Big|_{0}^{3} =$$

$$A = \left(-27 + \frac{81}{2}\right) - (0) =$$

$$A = 13.5 \text{ square units}$$