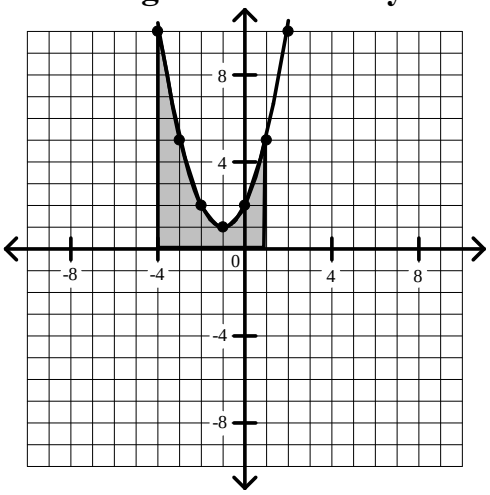
Calculus Worksheet #5 Unit 3 Selected Solutions

1. the region bounded by the x-axis, the lines x = -4 and x = 1, and the curve $y = x^2 + 2x + 2$

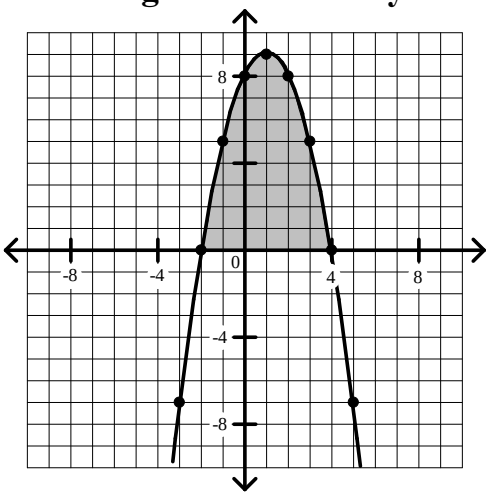


$$A = \int_{-4}^{1} (x^2 + 2x + 2)\,dx = \left(\frac{1}{3}x^3 + x^2 + 2x\right)\Big|_{-4}^{1} =$$

$$A = \left(\frac{1}{3} + 1 + 2\right) - \left(\frac{-64}{3} + 16 - 8\right) = \frac{10}{3} - \frac{-40}{3} =$$

$$A = \frac{50}{3} \text{ square units}$$

3. the region bounded by the x-axis and the curve $y = 8 + 2x - x^2$



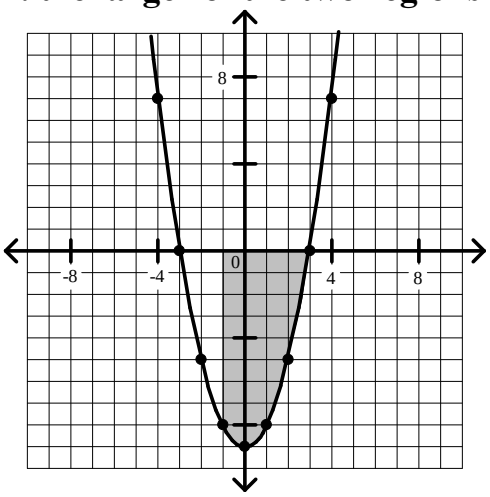
$$A = \int_{-2}^{4} (8 + 2x - x^2)\,dx = \left(8x + x^2 - \frac{1}{3}x^3\right)\Big|_{-2}^{4} =$$

$$A = \left(32 + 16 - \frac{64}{3}\right) - \left(-16 + 4 + \frac{8}{3}\right) =$$

$$A = \frac{80}{3} - \frac{-28}{3} =$$

$$A = 36 \text{ square units}$$

4. the larger of the two regions bounded by the x-axis, the line x = -1 and the curve $y = x^2 - 9$



$$A = \left| \int_{-1}^{3} (x^2 - 9)\,dx \right| = \left| \left(\frac{1}{3}x^3 - 9x\right)\Big|_{-1}^{3} \right| =$$

$$A = \left| (9 - 27) - \left(\frac{-1}{3} + 9\right) \right| = \left| -18 - \frac{26}{3} \right| =$$

$$A = \frac{80}{3} \text{ square units}$$