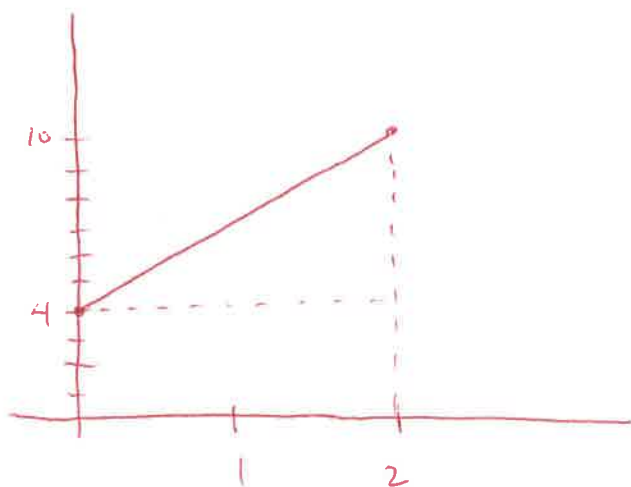


You may use a calculator and your homework, but not your books or notes. There are two problems worth 10 points each. **Show all of your work to receive full/partial credit.**

- 1) (#27 from 4.3) Sketch the region whose area is given by the definite integral. Then use a geometric formula to evaluate the integral.

$$\int_0^2 (3x + 4) dx$$



Triangle and rectangle

$$A_{\Delta} = \frac{1}{2}(2)(6) = 6 \quad , \quad A_{\square} = (2)(4) = 8$$

$$\int_0^2 (3x + 4) dx = 14$$

1) (#22 from 4.4) Evaluate the definite integral of the algebraic function.

$$\int_{-8}^{-1} \frac{x - x^2}{2\sqrt[3]{x}} dx$$

$$\int_{-8}^{-1} \frac{x - x^2}{2x^{1/3}} dx = \frac{1}{2} \int_{-8}^{-1} \frac{x}{x^{1/3}} - \frac{x^2}{x^{1/3}} dx$$

$$= \frac{1}{2} \int_{-8}^{-1} x^{2/3} - x^{5/3} dx = \frac{1}{2} \left[\frac{3}{5} x^{5/3} - \frac{3}{8} x^{8/3} \right]_{-8}^{-1}$$

$$= \frac{1}{2} \left[\frac{3}{5} (-1)^{5/3} - \frac{3}{8} (-1)^{8/3} - \left(\frac{3}{5} (-8)^{5/3} - \frac{3}{8} (-8)^{8/3} \right) \right]$$

$$= \frac{1}{2} \left[-\frac{3}{5} - \frac{3}{8} - \frac{3}{5} (-32) + \frac{3}{8} (256) \right]$$

$$= \frac{1}{2} \left[-\frac{39}{40} + \frac{96}{5} + 96 \right] = \frac{1}{2} \left[\frac{4569}{40} \right]$$

$$= \frac{4569}{80} = 57.1125$$