

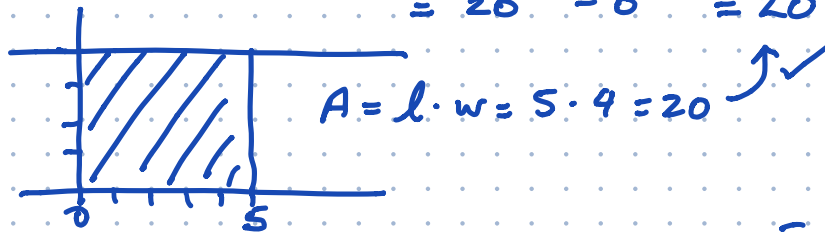
Examples

$$\int_0^5 4 \, dx = F(b) - F(a) = F(5) - F(0)$$

$$= 4 \cdot 5 - 4 \cdot 0$$

$$= 20 - 0 = 20$$

$$\begin{array}{ccc} F & & F' \\ 4x & \leftarrow & 4 \\ & \searrow \quad \nearrow & \\ & 4 \cdot 1 & \end{array}$$

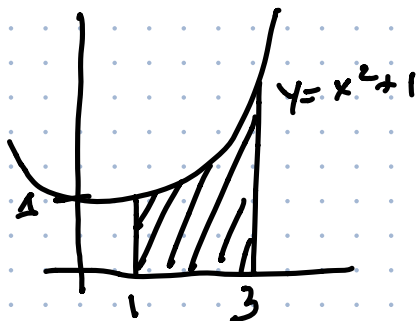
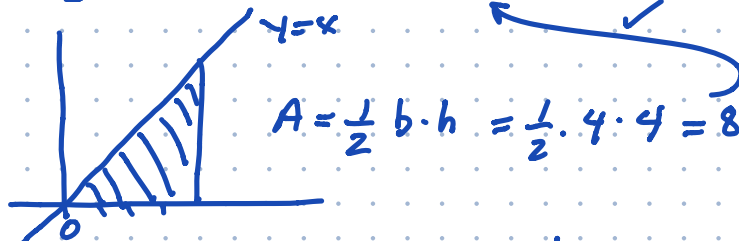


$$\int_0^4 x \cdot dx = F(4) - F(0)$$

$$= \frac{1}{2} (4)^2 - \frac{1}{2} (0)^2$$

$$= 8 - 0 = 8$$

$$\begin{array}{ccc} F & & F' = f \\ \frac{1}{2} x^2 & \leftarrow & x' \\ & \searrow \quad \nearrow & \\ & \frac{1}{2} \cdot 2x' & \end{array}$$



$$A = \int_1^3 (x^2 + 1) \, dx$$

$$= F(3) - F(1)$$

$$= \left[\frac{1}{3} x^3 + x \right]_1^3$$

$$\begin{array}{ccc} F & & F' \\ \frac{1}{3} x^3 + x & \leftarrow & x^2 + 1 \\ & \searrow \quad \nearrow & \\ & \frac{1}{3} \cdot 3x^2 + 1 & \end{array}$$

$$= \left(\frac{1}{3} 3^3 + 3 \right) - \left(\frac{1}{3} 1^3 + 1 \right)$$

$$= \underbrace{9 + 3}_{12 = 36/3} - \underbrace{\left(\frac{1}{3} + 1 \right)}_{4/3}$$

$$= \frac{36}{3} - \frac{4}{3} = \frac{32}{3}$$