

6.4 WORK

5.

$$Work = \int F dx = \frac{1}{2}(4 + 8) * 30 = 180$$

6.

$$\begin{aligned} \sum_{k=1}^n \frac{f(x_{k-1}) + f(x_k)}{2} \Delta x &= \frac{\Delta x}{2} [f(x_0) + 2[f(x_1) + \dots + f(x_{n-1})] + f(x_n)] = \Delta x \left[\frac{f(x_0) + f(x_n)}{2} + f(x_1) + \dots + f(x_{n-1}) \right] \\ &= 2[4.55 + 5.8 + 7.0 + 8.8 + 9.6 + 8.2 + 6.7 + 5.2] \end{aligned}$$

7.

$$\begin{aligned} F &= kx \Rightarrow k = \frac{F}{x} \\ W &= \int_0^6 \frac{10}{4} x dx = 45 \end{aligned}$$

14.

$$\int_0^H \rho g y dy = \rho g \frac{H^2}{2} = \frac{80}{10} * 9.8 * \frac{36}{2} = 1411.2$$

27.

$$W = \int P \pi r^2 dx = \int_{V_1}^{V_2} P dV$$

30.

$$W = \int_R^{R+h} \frac{GMm}{r^2} dr = GMm \left(\frac{1}{R} - \frac{1}{R+h} \right) = m \frac{GM}{R(R+h)} h$$