

Basic Calculus Formula Sheet

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

$$\frac{d}{dx}(k) = 0$$

$$\frac{d}{dx}(kx) = k$$

$$\frac{d}{dx}(kx^n) = knx^{n-1}$$

$$\frac{d}{dx}(uv) = uv' + vu'$$

$$\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{vu' - uv'}{v^2}$$

$$\frac{d}{dx}(ku^n) = knu^{n-1} \frac{du}{dx}$$

$$\frac{d}{dx}(e^u) = u'e^u$$

$$\frac{d}{dx}(b^u) = u' \ln(b)b^u$$

$$\frac{d}{dx}(\ln u) = \frac{u'}{u}$$

$$\frac{d}{dx}(\log_b u) = \frac{u'}{u \ln b}$$

$$\int kf(x) dx = k \int f(x) dx$$

$$\int x^n dx = \frac{x^{n+1}}{n+1} + C, n \neq -1$$

$$\int e^{kx} dx = \frac{e^{kx}}{k} + C$$

$$\int b^{kx} dx = \frac{b^{kx}}{k \ln(b)} + C$$

$$\int \frac{1}{x} dx = \ln|x| + C$$

$$\int_a^b f(x) dx \approx \Delta x \sum_{i=0}^{n-1} f(x_i) \text{ (left end)}$$

$$\Delta x = \frac{b-a}{n}$$

$$\text{average of } f(x) = \frac{\int_a^b f(x) dx}{b-a}$$

$$y - y_1 = m(x - x_1)$$

$$P(x) = R(x) - C(x)$$

$$R(x) = x \cdot \rho(x)$$