

Formulas for Chapter 7:

Arc Length:

$$s = \int_a^b \sqrt{1 + [f'(x)]^2} dx$$

Area of a Surface of Revolution:

$$S = 2\pi \int_a^b r(x) \sqrt{1 + [f'(x)]^2} dx$$

Work:

$$W = \int_a^b F(x) dx$$

Centroid:

$$A = \int_a^b (f(x) - g(x)) dx$$

$$\bar{x} = \frac{1}{A} \int_a^b x(f(x) - g(x)) dx$$

$$\bar{y} = \frac{1}{A} \int_a^b \left(\frac{f(x) + g(x)}{2} \right) (f(x) - g(x)) dx$$

Force exerted by a fluid:

$$F = w \int_c^d h(y) L(y) dy$$