

7.1-7.2 Area & Volume Formula Sheet

$$\text{Area} = \int_{x_1}^{x_2} (\text{Top graph} - \text{Bottom graph}) dx$$

(in the forms of "y = ___")

$$\text{Area} = \int_{y_1}^{y_2} (\text{Right graph} - \text{Left graph}) dy$$

(in the form of "x = ___")

Disc Method: (Top – Bottom) – Vertical Radius – Horizontal AOR

$$V = \pi \int_{x_1}^{x_2} [R(x)]^2 dx$$

(expression(s) used above has form: "y = ___")

Disc Method: (Right – Left) – Horizontal Radius Vertical AOR

$$V = \pi \int_{y_1}^{y_2} [R(y)]^2 dy$$

(expression(s) used above has form: "x = ___")

Washer Method: (Top – Bottom), Vertical Radius (Horizontal AOR)

$$V = \pi \int_{x_1}^{x_2} [R(x)]^2 - [r(x)]^2 dx$$

(expression(s) used above has form: "y = ___")

Washer Method: (Right – Left), Horizontal Radius (Vertical AOR)

$$V = \pi \int_{y_1}^{y_2} [R(y)]^2 - [r(y)]^2 dy$$

(expression(s) used above has form: "x = ___")

Top-Bottom Vertical base

$$V = \int_{x_1}^{x_2} [\text{Area of cross section}] dx$$

*Note: All values in integral are in terms of x
(in the form of "y = ___")

Right-Left Horizontal base

$$V = \int_{y_1}^{y_2} [\text{Area of cross section}] dy$$

*Note: All values in integral are in terms of y
(in the forms of "x = ___")

Area formulas for Cross sections:

1. Square: $A = (\text{base})^2$

2. Isosceles Right Triangle (leg on base):

$$A = \frac{1}{2}(\text{base})^2$$

3. Isosceles Right Triangle (hypotenuse on base): $A = \frac{1}{4}(\text{base})^2$

4. Rectangle:
 $A = (\text{base})(\text{height})$

5. Equilateral Triangle: $A = \frac{\sqrt{3}}{4}(\text{base})^2$

6. Semicircle: $A = \frac{\pi}{8}(\text{base})^2$