

MTH 112 : Spring 2021

Formula Sheet for Exam 1

- Important Area Formulas

- The area of a disk of radius r is given by $A = \pi r^2$.
- The area of an annulus (or washer) with outer radius R and inner radius r is given by

$$A = \pi [R^2 - r^2].$$

- The surface area of a cylindrical shell with radius r and height h is given by

$$A = 2\pi r h.$$

- Arc Length and Surface Area

- The **arc length**, L , of a curve $y = f(x)$ on an interval $[a, b]$ is given by

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

provided the derivative is continuous on (a, b) .

- The **surface area**, S , generated by revolving the graph of $y = f(x)$ (for $f(x) \geq 0$) on an interval $[a, b]$ about the x -axis is given by

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

provided the derivative is continuous on (a, b) .