

## **Helpful Formulas for Related Rates Questions**

### Circle

$$\text{Circumference} = 2\pi r$$

$$\text{Area} = \pi r^2$$

### Cylinder

$$\text{Area} = 2\pi r h + 2\pi r^2$$

$$\text{Volume} = \pi r^2 h$$

### Cone

$$\text{Volume} = \frac{1}{3} \pi r^2 h$$

### Sphere

$$\text{Area} = 4\pi r^2$$

$$\text{Volume} = \frac{4}{3} \pi r^3$$