# Reference Sheet

## Measurement

**Limits of accuracy**

- Absolute error = \( \frac{1}{2} \times \text{precision} \)
- Upper bound = \( \text{measurement} + \text{absolute error} \)
- Lower bound = \( \text{measurement} - \text{absolute error} \)

### Length

\[ l = \frac{\theta}{360} \times 2\pi r \]

### Area

\[ A = \frac{\theta}{360} \times \pi r^2 \]

\[ A = \frac{h}{2} (a + b) \]

\[ A \approx \frac{h}{2} (d_f + d_i) \]

### Surface area

\[ A = 2\pi r^2 + 2\pi rh \]

\[ A = 4\pi r^2 \]

### Trigonometry

- \( \sin A = \frac{\text{opp}}{\text{hyp}} \)
- \( \cos A = \frac{\text{adj}}{\text{hyp}} \)
- \( \tan A = \frac{\text{opp}}{\text{adj}} \)

\[ A = \frac{1}{2} ab \sin C \]

\[ \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} \]

\[ c^2 = a^2 + b^2 - 2ab \cos C \]

\[ \cos C = \frac{a^2 + b^2 - c^2}{2ab} \]

## Financial Mathematics

**Future Value**

\[ FV = PV (1 + r)^n \]

### Straight-line method of depreciation

\[ S = V_0 - Dn \]

### Declining-balance method of depreciation

\[ S = V_0 (1 - r)^n \]

## Statistical Analysis

**An outlier is a score**

- less than \( Q_1 - 1.5 \times IQR \)
- or
- more than \( Q_3 + 1.5 \times IQR \)

\[ z = \frac{x - \overline{x}}{s} \]

## Normal distribution

- approximately 68% of scores have z-scores between -1 and 1
- approximately 95% of scores have z-scores between -2 and 2
- approximately 99.7% of scores have z-scores between -3 and 3