# Math Review!

# Requirements
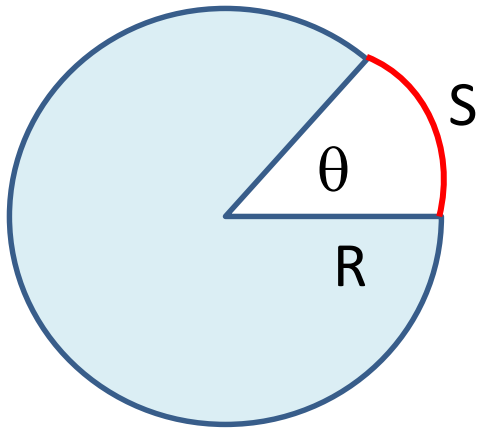
- Scientific Calculator

- Ruler

- Colour pencils

# Unit Conversion

- Given units not always useful or correct for a given formula

- e.g. 60 mi/h in kinematics should be in m/s

- Need conversion factors
  - 1 h = 3600 s (probably know this)
  - 1 mi = 1609 m (probably look up – see text)

$$60 \frac{mi}{h} = 60 \frac{mi}{h} \times \frac{1609\ m}{1\ mi} \times \frac{1\ h}{3600\ s} = 26.8 \frac{m}{s}$$
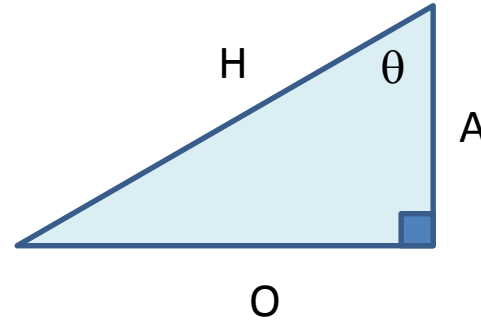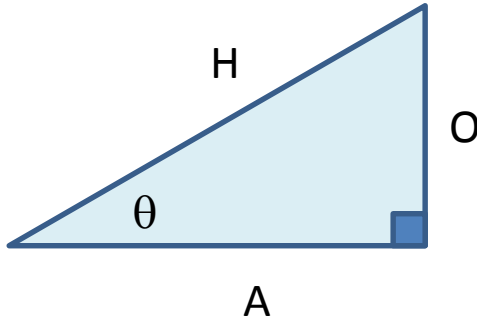
- Note $5000\ m^2 = 5000\ m \times m \times \frac{1\ km}{1000\ m} \times \frac{1\ km}{1000\ m} = 5 \times 10^{-3} km^2$

# Trigonometry



- $\theta = S/R$
- Has no units! (units of S and R cancel)
- Is a ratio
- Call it radians to specify a circle.
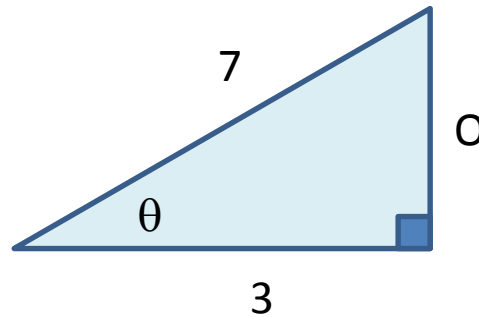- $2\pi = 360°$

# Right Angle Triangles



$$O^2 + A^2 = H^2$$

$$sin\theta = \frac{O}{H} \qquad cos\theta = \frac{A}{H} \qquad tan\theta = \frac{O}{A}$$

$$\theta = sin^{-1}\left(\frac{O}{H}\right) \quad \theta = cos^{-1}\left(\frac{A}{H}\right) \quad \theta = tan^{-1}\left(\frac{O}{A}\right)$$

Calculator setting DRG determines if $\theta$ is in degrees or radians!

# Example



- $O = \sqrt{7^2 - 3^2} = 6.325$
- Have A and H, so use cos$^{-1}$
- $\theta$ = cos$^{-1}$(3/7) = 64.62° = 1.128 *rad*