### Solving Trig Problems

\[ \sin \theta = \frac{\text{opp}}{\text{hyp}} \quad \cos \theta = \frac{\text{adj}}{\text{hyp}} \quad \tan \theta = \frac{\text{opp}}{\text{adj}} \]

**Version 1: Finding the top side**
i.e. Finding the opposite for sine or tangent or the adjacent for cosine.

1. **Label** the triangle.
2. Choose the appropriate formula.
   \[ \sin \theta = \frac{\text{opp}}{\text{hyp}} \]
3. **Substitute** in the numbers.
   \[ \sin 35 = \frac{x}{24} \]
4. **Rearrange** for \( x \).
   \[ x = 24 \sin 35 = 13.77 \text{cm to 2 d.p.} \]

**Version 2: Finding the other side**
i.e. Finding the hypotenuse for sine or cosine or the adjacent for tangent.

1. **Label** the triangle.
2. Choose the appropriate formula.
   \[ \sin \theta = \frac{\text{opp}}{\text{hyp}} \]
3. **Substitute** in the numbers.
   \[ \sin 20 = \frac{10}{x} \]
4. **Rearrange** for \( x \).
   \[ x = \frac{10}{\sin 20} = 29.24 \text{cm to 2 d.p.} \]

**Version 3: Finding the angle**
i.e. Finding a missing angle when you know the length of two sides.

1. **Label** the triangle.
2. Choose the appropriate formula.
   \[ \sin \theta = \frac{\text{opp}}{\text{hyp}} \]
3. **Substitute** in the numbers.
   \[ \sin x = \frac{16}{30} = 0.5333 \ldots \]
4. **Rearrange** for \( x \).
   \[ x = \sin^{-1}(0.5333 \ldots) = 32.2^\circ \text{ to 1 d.p.} \]