

2025A1

BASIC TRIGONOMETRY

Level 1:

To find how tall the wind turbine is (opposite side), we need to know the adjacent side, and the angle we need to use with the tangent function.

$$\text{Tan}(\theta) = \frac{\text{Opposite}}{\text{Adjacent}}$$

$$\text{Tan}(20.8) = \frac{\text{Opposite}}{250\text{m}}$$

$$250\text{m} \times \text{Tan}(20.8) = \text{Opposite}$$
$$\mathbf{95\text{m} = \text{Opposite}}$$

The height from the ground to the top of the hub is 95 meters.

Level 2:

Since we know the adjacent and opposite sides and are trying to find an angle, we need to use inverse tangent.

$$\text{Tan}^{-1}\left(\frac{\text{Opposite}}{\text{Adjacent}}\right) = \theta$$

$$\text{Tan}^{-1}\left(\frac{180\text{m}}{250\text{m}}\right) = \theta$$
$$\mathbf{35.8^\circ = \theta}$$

The angle between the two turbines is 35.8 degrees.