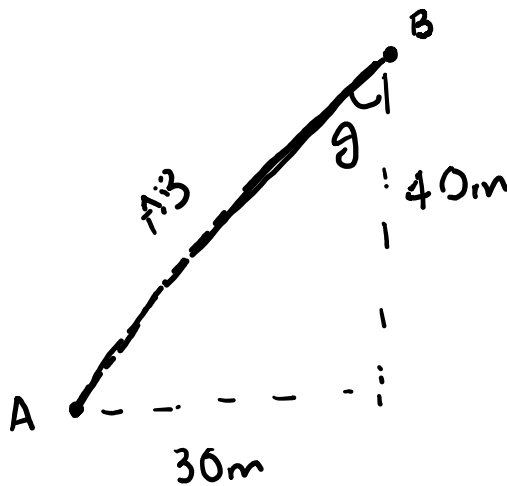


Surveying Example

A surveyor sets out from a control station A and walks due East for 30 m, then due North for 40 m to reach station B.

The surveyor then returns directly to station A along the shortest possible route.

- a) Calculate the distance of the direct route from B to A.
- b) Calculate the bearing of the direct route from B to A.



$$a^2 + b^2 = c^2$$

$$30^2 + 40^2 = c^2$$

$$c = \sqrt{30^2 + 40^2}$$

$$= \sqrt{900 + 1600}$$

$$= \sqrt{2500} = \underline{50m}$$

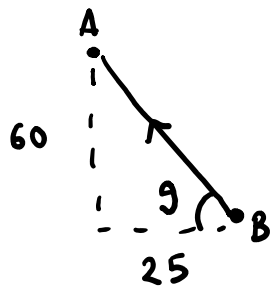
$$\theta = \tan^{-1} \left(\frac{30}{40} \right) = 36.9^\circ$$

$$WCB = 180 + 36.9 = 216.9^\circ$$

Question 2

A surveyor leaves benchmark A and walks due South for 60 m, then due East for 25 m to reach point B. The surveyor then returns directly to benchmark A by the shortest route.

- a) Calculate the **distance** of the direct route from B to A.
- b) Calculate the **bearing** of the direct route from B to A.



$$AB = \sqrt{60^2 + 25^2} = \sqrt{4225} = 65 \text{ m}$$

$$\theta = \tan^{-1}\left(\frac{60}{25}\right) = 67.4^\circ$$

$$\text{WCB} = 270 + 67.4 = 337.4^\circ$$

Question 3

A surveyor sets out from control point P and measures 80 m due West, then 30 m due North to reach point Q.

The surveyor then observes point P directly from Q.

- a) Calculate the **distance** from Q to P.
- b) Calculate the **bearing** from Q to P.