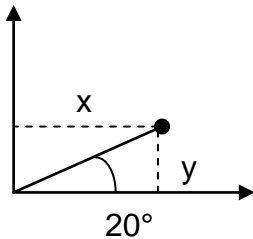


MATHEMATICS ANSWERS

Level Three

Polar and Rectangular.

- 1) $x = 1.813\text{m}$ and $y = 0.845\text{m}$, since



$$\frac{y}{r} = \sin 25^\circ$$

$$\Rightarrow y = r \sin 25^\circ = 0.845\text{m} \quad \checkmark$$

$$\frac{x}{r} = \cos 25^\circ$$

$$\Rightarrow x = r \cos 25^\circ = 1.813\text{m} \quad \checkmark$$

Must use

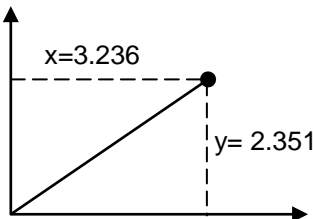
$$r = \sqrt{x^2 + y^2} = \sqrt{1.813^2 + 0.845^2} = 2$$

$$\theta = \tan^{-1}\left(\frac{y}{x}\right) = \tan^{-1}\left(\frac{0.845}{1.813}\right) = 25 \text{ degrees}$$

2)

- | | |
|-----------------|---------------|
| a) $x = 3.236$ | $y = 2.351$ |
| b) $x = -3.146$ | $y = 1.534$ |
| c) $x = -12.58$ | $y = -8.170$ |
| d) $x = 1.814$ | $y = 25.937$ |
| e) $x = 4.286$ | $y = -40.775$ |

- 3) An example of a. is shown



- 4) Distances and bearings:

- 6.71 at 26.6°
- 5.39 at 248.2°
- 9.85 at 156.0°

5)

- | | | |
|--------------|---|---|
| a. 116943.0m | @ | $50^\circ 01' 40''$ (or 50.03°) |
| b. 72319.9m | @ | $80^\circ 09' 37''$ (or 80.16°) |
| c. 43788.9m | @ | $04^\circ 33' 53''$ (or 4.56°) |
| d. 74406.35m | @ | $28^\circ 53' 15''$ (or 28.89°) |

- a. 65398.26m
- b. 74646.07m
- c. 38933.48m
- d. 54594.56m

7)

a. B: 458259.0mE
 862157.0mN

 C 458304.6mE
 861987.0mN

 D 458181.5mE
 861965.3mN

b. Difference in Northing = 191.70m and Easting -22.5m
 Convert rectangular to polar \Rightarrow 193.02m @ 353°18'21"

c. 594.02m