

Paper 1

Question 1

$$\begin{aligned} \text{Using } m &= \tan \theta, \theta = 60^\circ \\ &= \tan 60^\circ \\ &= \sqrt{3} \end{aligned}$$

\therefore Equation of line is

$$y - 0 = \sqrt{3}(x - (-2))$$

$$y = \sqrt{3}(x + 2)$$

$$\therefore y = \sqrt{3}x + 2\sqrt{3}$$

$$\text{So } \sqrt{3}x - y + 2\sqrt{3} = 0.$$

Question 2

$$\text{Circle centre A: } x^2 + y^2 + 6x + 4y - 12 = 0 \quad \text{Centre A } (-3, -2)$$

$$\text{Circle centre B: } x^2 + y^2 - 6x - 12y + 20 = 0 \quad \text{Centre B } (3, 6)$$

(a) P is the midpoint of AB.

$$\therefore P = \left(\frac{-3+3}{2}, \frac{-2+6}{2} \right) = (0, 2)$$

(b) radius = $\sqrt{(-3)^2 + (-2)^2 - (-12)} = \sqrt{9+4+12} = \sqrt{25} = 5$ units

$$\therefore AB = 2r = 10 \text{ units}$$

$$\text{or } d_{AB}^2 = [3 - (-3)]^2 + [6 - (-2)]^2 = 6^2 + 8^2 = 100$$

$$\therefore AB = \sqrt{100} = 10 \text{ units.}$$