

Ex A.1

Q1 (i) $x^2 + y^2 = 4$

(ii) $x^2 + y^2 = 25$

(iii) $x^2 + y^2 = 2$

(iv) $x^2 + y^2 = 18$

$[(3\sqrt{2})^2 = 9(2) = 18]$

(v) $x^2 + y^2 = 9/16 \Rightarrow 16x^2 + 16y^2 = 9$

(vi) $x^2 + y^2 = 25/4 \Rightarrow 4x^2 + 4y^2 = 25$ $[2^{1/2} = 5/2]$

Q2 (0,0) (3,4)

$r = \sqrt{(3-0)^2 + (4-0)^2} = \sqrt{9+16} = \sqrt{25} = 5$

eqn: $x^2 + y^2 = 25$

Q3 (0,0) (-4,1)

$r = \sqrt{(-4-0)^2 + (1-0)^2} = \sqrt{16+1} = \sqrt{17}$

eqn: $x^2 + y^2 = 17$

Q4 (i) centre = (0,0)

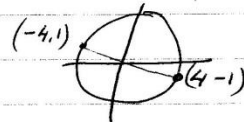
(ii) $r = \sqrt{(4-0)^2 + (3-0)^2} = \sqrt{16+9} = \sqrt{25} = 5$

(iii) eqn: $x^2 + y^2 = 25$

Q5 centre = (0,0)

$r = \sqrt{(-4-0)^2 + (1-0)^2}$
 $= \sqrt{16+1} = \sqrt{17}$

eqn = $x^2 + y^2 = 17$



Q6 (i) $x^2 + y^2 = 9$ $r = 3$

(ii) $x^2 + y^2 = 1$ $r = \sqrt{1} = 1$

(iii) $x^2 + y^2 = 27$ $r = \sqrt{27} = 3\sqrt{3}$

(iv) $4x^2 + 4y^2 = 25$ $x^2 + y^2 = 25/4$ $r = 5/2$

(v) $9x^2 + 9y^2 = 4$ $x^2 + y^2 = 4/9$ $r = 2/3$

(vi) $16x^2 + 16y^2 = 49$ $x^2 + y^2 = 49/16$ $r = 7/4$

$$\underline{Q7} \quad \perp \text{ dis} = \frac{|2(0) + 1(0) - 5|}{\sqrt{2^2 + 1^2}} = \frac{|-5|}{\sqrt{5}} = \frac{5}{\sqrt{5}} = \frac{5\sqrt{5}}{5} = \sqrt{5}$$

$$r = \sqrt{5}$$
$$\text{eqn: } x^2 + y^2 = 5$$

$$\underline{Q8} \quad \perp \text{ dis} = \frac{|4(0) - 3(0) - 25|}{\sqrt{4^2 + 3^2}} = \frac{25}{\sqrt{25}} = \frac{25}{5} = 5 = r$$

$$\text{eqn: } x^2 + y^2 = 25$$

$$\underline{Q9} \quad \perp \text{ dis} = \frac{|3(0) - 1(0) + 10|}{\sqrt{3^2 + 1^2}} = \frac{10}{\sqrt{10}} = \sqrt{10} = r$$

$$\text{eqn: } x^2 + y^2 = 10$$

$$\underline{Q10} \quad (0,0) \quad r = 2\sqrt{5}$$
$$\text{eqn: } x^2 + y^2 = 20$$

$$\perp \text{ dis } (0,0) \text{ to } x - 2y + 10 = 0$$
$$= \frac{|1(0) - 2(0) + 10|}{\sqrt{1^2 + 2^2}} = \frac{10}{\sqrt{5}} = \frac{10\sqrt{5}}{5} = 2\sqrt{5}$$

$$\perp \text{ dis} = 2\sqrt{5} = \text{radius} \Rightarrow \text{is a tangent}$$