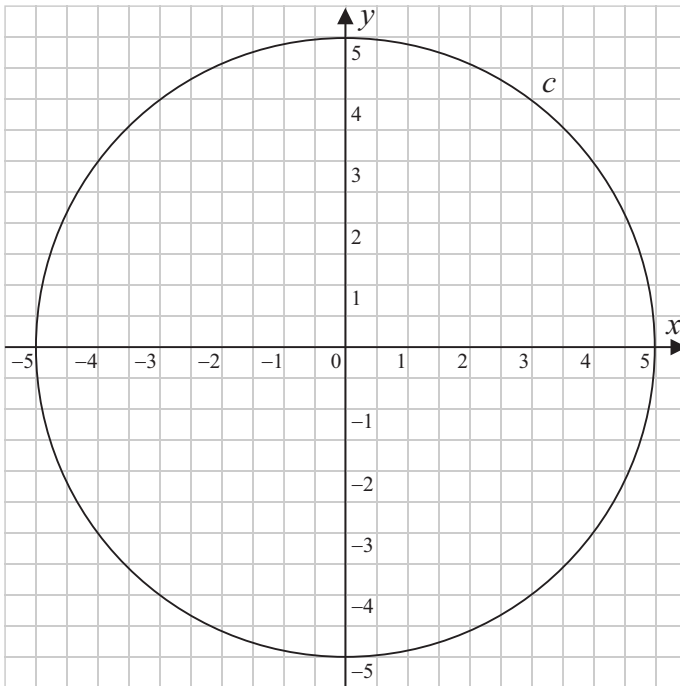


## LC 2015 (SET B): PAPER 2

### QUESTION 3 (25 MARKS)

#### Question 3 (a)



**FORMULAE AND TABLES BOOK**  
**Co-ordinate geometry: Circle** [page 19]

Given centre  $(h, k)$  and radius  $r$

$$(x - h)^2 + (y - k)^2 = r^2$$

$c$  is a unit circle with centre  $(0, 0)$  with radius 5 units.

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

Centre =  $(0, 0)$ ,

$$\text{Radius } r = \sqrt{25} = 5$$

**MARKING SCHEME NOTES**

**Question 3 (a) [Scale 10D (0, 2, 5, 8, 10)]**

- 2: • Any relevant work e.g. Identifies correct centre of circle or works to  $r^2 = 25$  and/or  $\sqrt{25}$  and stops  
 • Attempt to scale an axis
- 5: • Any two of the four components Centre, Radius, Scale or Drawing correct
- 8: • Any three of the four components Centre, Radius, Scale or Drawing correct

#### Question 3 (b)

$A(-4, 3) \in c: x^2 + y^2 = 25$ ? [Substitute the point  $A(-4, 3)$  into the equation of the circle  $c$ .

$(-4)^2 + (3)^2$   $A(-4, 3)$  is on  $c$  if  $A$  satisfies the equation of the circle.]

$$= 16 + 9$$

$$= 25$$

**MARKING SCHEME NOTES**

**Question 3 (b) [Scale 10B (0, 4, 10)]**

- 4: • Identifies correct relevant formula, e.g. writes  $[\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}, x^2 + y^2 = r^2]$   
 • Any correct or consistent substitution.  
 • Radius = 5 (relevant work).  
 • No conclusion

**Question 3 (c)**

Circle  $s$ : Centre =  $(h, k) = (-4, 3)$ , radius =  $r$

$$s: (x - (-4))^2 + (y - 3)^2 = r^2$$

$$s: (x + 4)^2 + (y - 3)^2 = r^2$$

$$(3, 4) \in s \Rightarrow (3 + 4)^2 + (4 - 3)^2 = 49 + 1 = 50$$

$$\therefore s: (x + 4)^2 + (y - 3)^2 = 50$$

or

The centre of the circle is  $O(-4, 3)$ . Call the point on the circle  $B(3, 4)$ . The radius  $r$  is the distance  $|OB|$ .

$$O(-4, 3) = (x_1, y_1), A(3, 4) = (x_2, y_2)$$

$$r = |OA| = \sqrt{(3 - (-4))^2 + (4 - 3)^2}$$

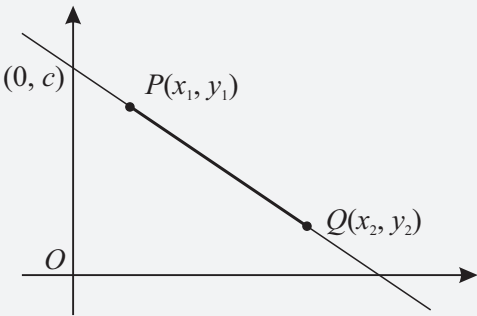
$$= \sqrt{7^2 + 1^2}$$

$$= \sqrt{49 + 1} = \sqrt{50}$$

$$\therefore s: (x + 4)^2 + (y - 3)^2 = 50$$

[Use the circle formula to find the equation of  $s$ . Substitute in  $(3, 4)$  to find the right-hand side of the equation.]

**FORMULAE AND TABLES BOOK**  
**Co-ordinate geometry: Line**



Length of  $PQ$  [page 18]  
 $|PQ| = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

**MARKING SCHEME NOTES**

**Question 3 (c) [Scale 5B (0, 3, 5)]**

3: • Identifies a correct relevant formula

e.g.  $[\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}, (x - h)^2 + (y - k)^2 = r^2, x^2 + y^2 + 2gx + 2fy + c = 0]$

- Any correct substitution and stops
- Radius calculated
- Fully correct or consistent substitution without calculation
- Correct calculation with one incorrect substitution