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| Student No.:  | Date: / / | Score:<br><br><b>/24</b> |
| Student Name: |           |                          |

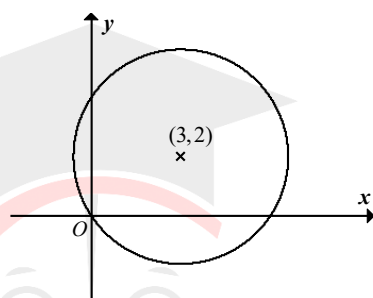
## Revision of Equations of Circles (I)

### Exercises

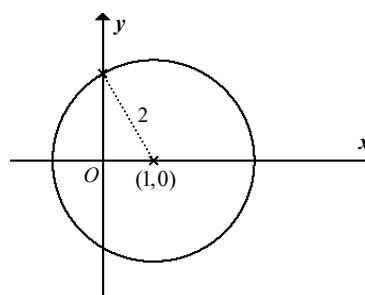
(Unless otherwise specified, all equations of circles should be answered in general form.)

1. Find the equation of circle in standard form.

(a)

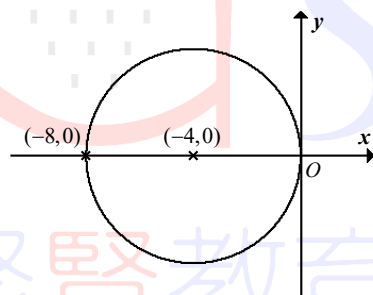


(b)

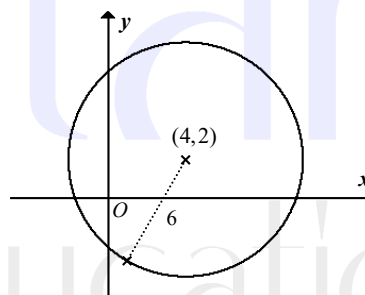


2. Find the equation of circle in general form.

(a)



(b)



3. Find the equation of the circle with centre  $(-5, 2)$  which pass through the point  $(0, 6)$ .

4. A circle passes through three points  $X(5, 7)$ ,  $Y(2, 4)$  and  $Z(5, 1)$ .

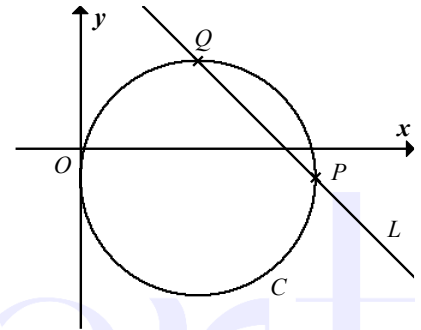
- (a) Find the equation of the circle.  
 (b) Does  $W(8, 4)$  lie on the circle?

## S5E-32A

5. Find the number of points of intersection of the circle  $S: x^2 + y^2 - 6x - 2y - 52 = 0$  and the straight line  $L: 4x - 2y + 24 = 0$ .

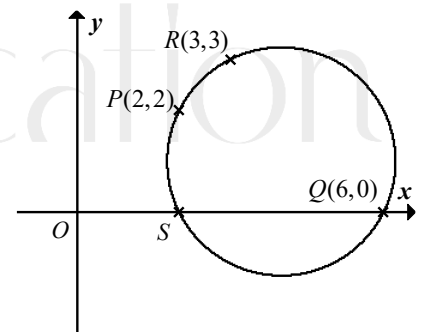
6. The circle  $C: x^2 + y^2 - 8x + 2y + 1 = 0$  and the straight line  $L: x + y - 7 = 0$  are given. As shown in the figure, if  $L$  and  $C$  intersect at  $P$  and  $Q$ , find

- (a) the coordinates of  $P$  and  $Q$ .  
 (b) the length of  $PQ$ .

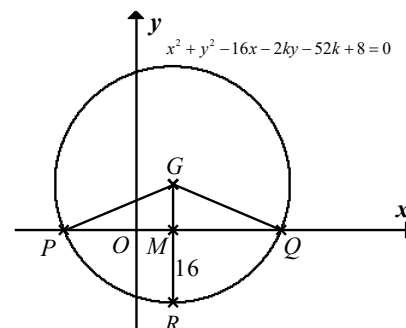


7. The figure shows three points  $P(2,2)$ ,  $Q(6,0)$  and  $R(3,3)$ .

- (a) Show that  $PR$  is perpendicular to  $QR$ .  
 (b) Find the equation of the circle passing through  $P$ ,  $Q$  and  $R$ .  
 (c) If the circle obtained in (b) cuts the  $x$ -axis at two points  $Q$  and  $S$ , find the coordinates of  $S$ .



8. In the figure, the equation of the circle with centre  $G$  is  $x^2 + y^2 - 16x - 2ky - 52k + 8 = 0$ . The circle intersects the  $x$ -axis at  $P$  and  $Q$ .  $R$  is a point on the circle such that  $GR$  and  $PQ$  are perpendicular to each other and meet at  $M$ .
- (a) Express the coordinates of  $G$  and the radius of the circle in terms of  $k$ .
- (b) If  $MR = 16$ , find the value of  $k$ .
- (c) Find the coordinates of  $P$  and  $Q$ .



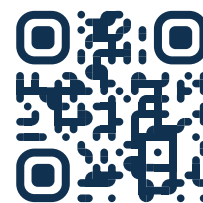
9. The equation of a circle  $S$  is  $x^2 + y^2 + 6x - 8y + 16 = 0$ .
- (a) Find the centre and radius of  $S$ .
- (b) Show that the point  $M(-2, 3)$  lies inside  $S$  and the origin  $O$  lies outside  $S$ .
- (c) Find the equation of the chord of  $S$  whose mid-point is  $M$ .
- (d) Find the length of a tangent to  $S$  from the origin.

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## S5E-32A

### M.C.

1. Which of the following does not represent a real circle?
- A.  $x^2 + y^2 - 4x - 4y + 13 = 0$   
B.  $x^2 + y^2 + 4x - 3y - 1 = 0$   
C.  $x^2 + y^2 - 4x + 6y + 3 = 0$   
D.  $3x^2 + 3y^2 - 6x + 12y - 6 = 0$
2. If the centre of the circle  $2x^2 + 2y^2 + kx - (2k + 1)y - 4 = 0$  lies on  $23x + 11y = 0$ , find the value of  $k$ .
- A.  $-6$   
B.  $6$   
C.  $-11$   
D.  $11$
3. Given that the straight line  $L: 2x - y = c$  has a negative  $y$ -intercept and is a tangent to the circle  $S: x^2 + y^2 - 2x - 3y + 2 = 0$ , find the value of  $c$ .
- A.  $-2$   
B.  $2$   
C.  $-3$   
D.  $3$
4. Which of the following straight lines cut(s) circle  $C: (x + 2)^2 + (y - 5)^2 = 30$  at two points?
- I.  $y = 3x - 2$   
II.  $x + y = 8$   
III.  $2x - 2y = 1$
- A. I only  
B. III only  
C. I & III only  
D. I, II & III



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