

## Circle

1. Write down the equation of the circle:
  - a) With centre at the origin and radius 4 units.
  - b) With centre (4,0) and passing through (-1,2). (4)
  
- 2 a) Write down the centre and radius of the circle  
 $x^2 + y^2 - 6x - 2y - 15 = 0$ . (2)  
  
b) State whether each of these points lies inside, outside or on the circle  

A(3,5)B(-2,1)C(9,0)(3)
  
3. Find the equation of the tangent to the circle  $x^2 + y^2 - 2x - 8y - 8 = 0$  at the point T(-3,1). (4)
  
4. For what values of K does  $x^2 + y^2 + 10x - 14y + K = 0$  represent a circle? (3)
  
5. The line with equation  $y + x = 5$  meets the circle with equation  $x^2 + y^2 - 8x + 2y - 3 = 0$  at points P and Q.
  - a) Find the coordinates of P and Q. (5)
  - b) Find the equation of the circle which has PQ as its diameter. (3)
  
6. For what values of K is the line with equation  $y = \frac{3}{4}x + k$ , a tangent to the circle with equation  $x^2 + y^2 = 16$ ? (5)

## Revision

7. A sequence is defined by the recurrence relation  $U_{n+1} = KU_n + 4$ .
  - a) Write down the condition on K for the sequence to have a limit as  $n \rightarrow \infty$ . (1)
  - b) Given that the limit is 10, find the value of K. (2)

**32 marks**