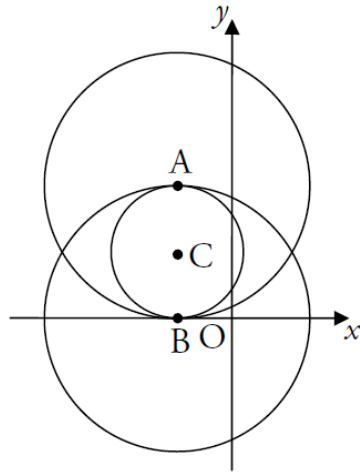


- 1 (a) Find the radius and the equation of the circle centred on the origin and passing through the point $(3, -4)$. 2
- (b) Determine whether the point $(8, -5)$ lies inside, outside or on this circle. 2

- 2 In the diagram below, the small circle has equation $(x + 3)^2 + (y - 4)^2 = 16$, with centre C.



A and B lie on the circle centred at C. The circle centred at B passes through A, and the circle centred at A passes through B. AB is parallel to the y -axis, and A, B and C are collinear.

- (a) Find the centre and radius of the three circles. 6
- (b) Write down the equations of the two large circles. 2
- 3 Find the equation of the tangent to the circle with equation $x^2 + y^2 - 8x + 6y + 15 = 0$ at the point $A(1, -2)$. 4
- 4 For which values of k does $x^2 + y^2 + 10x - 14y + k = 0$ represent a circle? 3

19 Marks
