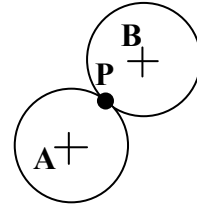


Higher-Circle.

1. Two congruent circles, with centres A and B, touch at P.
Relative to suitable axes, their equations are

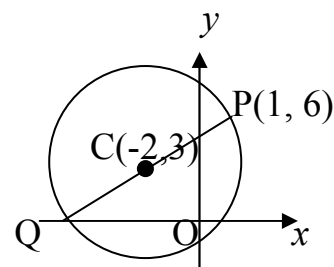
$$x^2 + y^2 + 6x + 4y - 12 = 0$$
$$x^2 + y^2 - 6x - 12y + 20 = 0.$$



- a) Find the coordinates of AP (3)
b) Find the length of AB (2)

2. A circle has centre C(-2, 3) and passes through P(1, 6).

- (a) Find the equation of the circle.
(b) PQ is a diameter of the circle. Find the equation of the tangent to this circle at Q.



3. For what range of values of c does the equation $x^2 + y^2 - 6x + 4y - c = 0$ represent a circle? (3)
4. Show that the line with equation $y = 4x - 2$ is a tangent to the circle with equation $x^2 + y^2 - 12x - 10y + 44 = 0$ and state the coordinates of the point of contact. (6)

TOTAL (20)