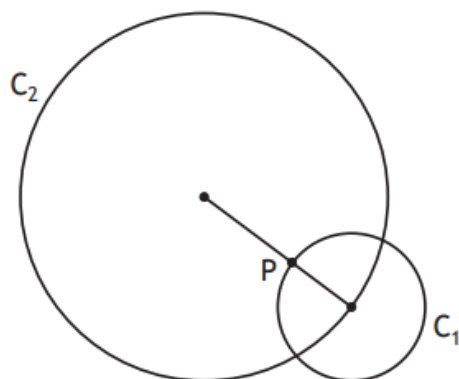


Higher Maths
SQA 2018 Paper 2
Question 12



Circle C_1 has equation $(x-13)^2 + (y+4)^2 = 100$.

Circle C_2 has equation $x^2 + y^2 + 14x - 22y + c = 0$.



- (a) (i) Write down the coordinates of the centre of C_1 . 1
(ii) The centre of C_1 lies on the circumference of C_2 .
Show that $c = -455$. 1

The line joining the centres of the circles intersects C_1 at P.

- (b) (i) Determine the ratio in which P divides the line joining the centres of the circles. 2
(ii) Hence, or otherwise, determine the coordinates of P. 2

P is the centre of a third circle, C_3 .

C_2 touches C_3 internally.

- (c) Determine the equation of C_3 . 1

Answers:

- (a) (i) $(13, -4)$ (ii) Substitute coordinates and process for c .
(b) (i) $3 : 2$ or $2 : 3$ (ii) $(5, 2)$
(c) $(x-5)^2 + (y-2)^2 = 1600$
or $x^2 + y^2 - 10x - 4y - 1571 = 0$