

(a) Find the centre and radius of the circle C

$$x^2 + y^2 - 8x + 4y + 11 = 0$$

$$(x-4)^2 - 16 + (y+2)^2 - 4 + 11 = 0$$

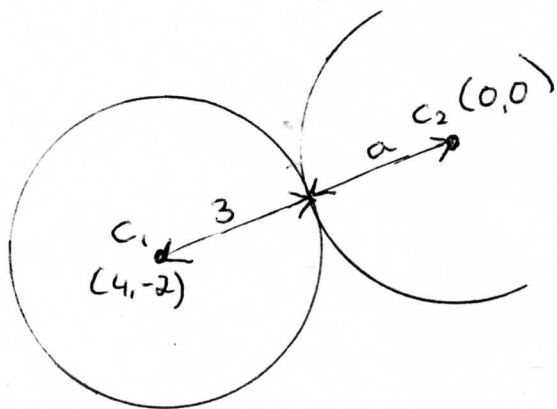
$$(x-4)^2 + (y+2)^2 = 16 - 11 + 4$$

$$(x-4)^2 + (y+2)^2 = 9$$

Centre $(4, -2)$ radius $= \sqrt{9} = 3$

(b) Given that the circle $x^2 + y^2 = a^2$ ($a > 0$) touches C externally, find the value of a , to 2dp.

$x^2 + y^2 = a^2$ has centre $(0, 0)$ radius a .



Two circles

Touch so

Sum of radii

equals

Distance between
Centres

$$3 + a = \sqrt{(4-0)^2 + (-2-0)^2}$$

$$3 + a = \sqrt{16 + 4}$$

$$3 + a = \sqrt{20}$$

$$a = \sqrt{20} - 3$$

$$a = 1.47 \text{ (2dp)}$$