4. The circle C has equation

$$x^2 + y^2 + 10x - 4y + 1 = 0$$

(a) Find

   (i) the coordinates of the centre of C

   (ii) the exact radius of C

(3)

The line with equation $y = k$, where k is a constant, cuts C at two distinct points.

(b) Find the range of values for k, giving your answer in set notation.

(3)