

14.

**In this question you must show all stages of your working.
Solutions relying entirely on calculator technology are not acceptable.**

The circle C has equation

$$x^2 + y^2 - 4kx + 2ky + 80 = 0$$

where k is a constant, $k > 4$

(a) Find, in terms of k ,

(i) the coordinates of the centre of C

(ii) the radius of C

(3)

Given that the line with equation $y = k - 2x$ does **not** meet or touch C ,

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

(5)