

15.

**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

$$x^2 + y^2 + 6x - 4y - 62 = 0$$

(a) Find

- (i) the coordinates of the centre of C
- (ii) the exact radius of C

(3)

The line l has equation $y = 2x + k$, where k is a constant.

- (b) Find the range of values of k for which C and l intersect at 2 distinct points.
Write the answer in set notation.

(5)