

8 The lines L_1 and L_2 are parallel.

L_1 has equation

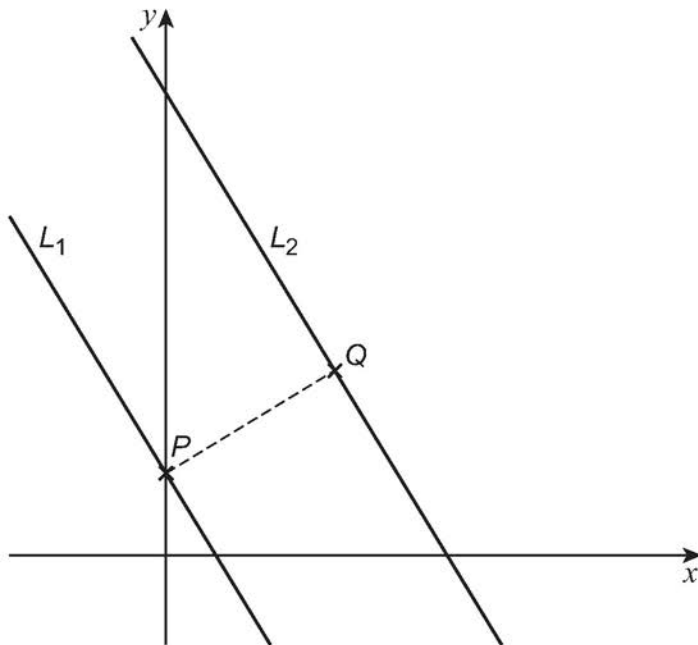
$$5x + 3y = 15$$

and L_2 has equation

$$5x + 3y = 83$$

L_1 intersects the y -axis at the point P .

The point Q is the point on L_2 closest to P , as shown in the diagram.



8 (a) (i) Find the coordinates of Q .

[5 marks]

8 (a) (ii) Hence show that $PQ = k\sqrt{34}$, where k is an integer to be found.

[2 marks]

8 (b) A circle, C , has centre $(a, -17)$.

L_1 and L_2 are both tangents to C .

8 (b) (i) Find a .

[2 marks]

8 (b) (ii) Find the equation of C .

[2 marks]