1.

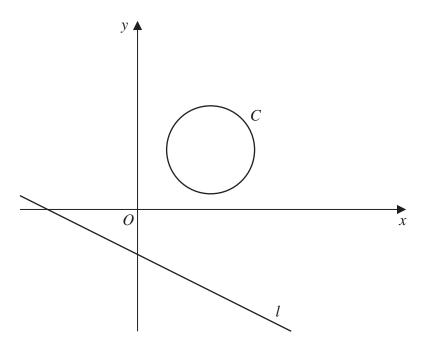


Figure 3

Figure 3 shows the circle C with equation

$$x^2 + y^2 - 10x - 8y + 32 = 0$$

and the line l with equation

$$2y + x + 6 = 0$$

- (a) Find
  - (i) the coordinates of the centre of C,
  - (ii) the radius of C.

**(3)** 

(b) Find the shortest distance between C and	1	l
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**(5)** 

2.	The	circle	C has	equation

$$x^2 + y^2 - 6x + 10y + k = 0$$

where k is a constant.

(a) Find the coordinates of the centre of C.

**(2)** 

Given that C does not cut or touch the x-axis,

(b) find the range of possible values for k.

(3)

3.	The	circle	C has	equation
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$$x^2 + y^2 - 10x + 4y + 11 = 0$$

- (a) Find
  - (i) the coordinates of the centre of C,
  - (ii) the exact radius of C, giving your answer as a simplified surd.

**(4)** 

The line *l* has equation y = 3x + k where *k* is a constant.

Given that l is a tangent to C,

(b) find the possible values of k, giving your answers as simplified surds.

**(5)** 


4.	A	circle	has	equation
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$$x^2 + y^2 - 10x + 16y = 80$$

- (a) Find
  - (i) the coordinates of the centre of the circle,
  - (ii) the radius of the circle.

**(3)** 

Given that P is the point on the circle that is furthest away from the origin O,

(b) find the exact length <i>C</i>	P
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**(2)** 

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	<b>5.</b>	A	circle	C	has	eq	uation
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$$x^2 + y^2 + 6kx - 2ky + 7 = 0$$

where k is a constant.

- (a) Find in terms of k,
  - (i) the coordinates of the centre of C
  - (ii) the radius of C

**(3)** 

The line with equation y = 2x - 1 intersects C at 2 distinct points.

(b) Find the range of possible values of k.

**(6)** 
