

## CHEMISTRY ONLINE

- TUITION -

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## PURE MATH

## ALGEBRA AND FUNCTION

| Level \& Board | EDEXCEL (A-LEVEL) |
| :--- | :--- |
| TOPIC: |  |
|  | CIRCLES |
| PAPER TYPE: |  |
|  | QUESTION PAPER-4 |
| TOTAL QUESTIONS | 8 |
|  |  |
| TOTAL MARKS | 64 | individual/ company/organization involved in copyright abuse.

## Questions <br> Q1.

(i) A circle $\mathrm{C}_{1}$ has equation

$$
x^{2}+y^{2}+18 x-2 y+30=0
$$

The line $l$ is the tangent to C 1 at the point $\mathrm{P}(-5,7)$.
Find an equation of l in the form $\mathrm{ax}+\mathrm{by}+\mathrm{c}=0$, where $\mathrm{a}, \mathrm{b}$ and c are integers to be found.
(ii) A different circle $\mathrm{C}_{2}$ has equation

$$
x^{2}+y^{2}-8 x+12 y+k=0
$$

where k is a constant.
Given that $\mathrm{C}_{2}$ lies entirely in the 4th quadrant, find the range of possible values for k .
(Total for question = 8 marks)

Q2.
Find an equation of a circle of radius $a$ and lying in the second quadrant such that it is tangent to both the axes.
(Total for question = 7 marks)

Q3.
Show that the lines $3 x-2 y=0$ and $2 x+3 y-13=0$ are tangents to the circle $x^{2}+y^{2}+6 x-4 y=0$
(6)
(Total for question = 6 marks)

Q4.
Show that the circles
$x^{2}+y^{2}+2 x-2 y-7=0$ and $x^{2}+y^{2}-6 x+4 y-9=0$ touch externally.
(7)
(Total for question = 7 marks)

Q5.
Show that the circles
$x^{2}+y^{2}+2 x-8=0$ and $x^{2}+y^{2}-6 x+6 y-46=0$ touch internally
(7)
(Total for question = 5 marks)

Q6.
Find equations of the circle of radius 2 and tangent to the line

$$
x-y-4=0 \text { at } A(1,-3) .
$$

(8)
(Total for question = 8 marks)

Q7.
The circle C has equation

$$
x^{2}+y^{2}-6 x+10 y+9=0
$$

(a) Find
(i) the coordinates of the centre of C
(ii) the radius of C
(5)

The line with equation $\mathrm{y}=\mathrm{kx}$, where k is a constant, cuts C at two distinct points.
(b) Find the range of values for k .
(3)
(Total for question = 8 marks)

Q8.
The Circle $C$ has the equation

$$
x^{2}+y^{2}-8 x+6 y+16=0
$$

(a) Find the coordinates of the center of C4.
(b) Find the radius of C4.
(c) Find the range of values for k .


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