Show all working where possible and remember to communicate your answers!

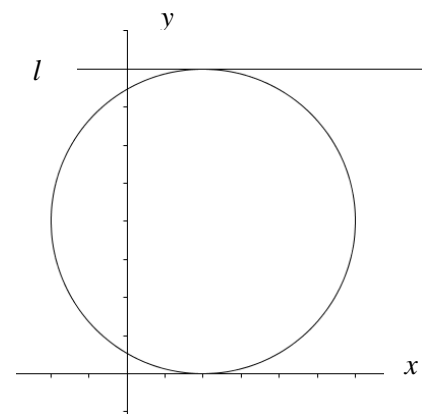Q1. State the equation of the circle with centre (3, 1) and radius 2

Q2. Find the equation of the circle with centre (0, 0) and passes through the point (-4, 1)

Q3. The line segment (3, 5) and (-1, 1) is the diameter of a circle. Find the equation of the circle.

Q4. State the centre and radius of the circle $x^2 + y^2 - 4x + 8y - 5 = 0$

Q5. Given a(k, 2) and b(-6, -k) are end points of a diameter of a circle C with centre (3, -5). Find the value of k and hence the radius length of C

Q6. The equation of a circle is shown in the diagram below. The x – axis and the line l are parallel tangents to the circle. What is the equation of the line l if the equation of the circle is $x^2 + y^2 - 4x - 8y + 4 = 0$

Q7. Find the points where the line y = -1 intersects

The circle with equation $x^2 + y^2 - 6x + 10y + 2 = 0$

Q8. Find the equation of the tangent to the circle $x^2 + y^2 - 6x - 2y - 3 = 0$ at the point (5, 4)

Q9. Two congruent circles, with centres A and B touch at P.

Relative to suitable axes, their equations are

$x^2 + y^2 + 6x + 4y - 12 = 0$ and

$x^2 + y^2 - 6x - 12y + 20 = 0.$

a) Find the coordinates of P.
b) Find the length of AB.