Geometry 2 Questions

The Line

Question 1:

The coordinates of 3 points A, B and C are:

A (2,2), B (6,-6) and C(-2,-3)

a) Find the equation of AB.

b) The line AB intersects the y-axis at D.

Find the coordinates of D.

c) Find the perpendicular distance from C to AB.

d) Hence, find the area of the triangle ADC.

The Circle

Question 2

A circle has centre (2,3) and contains the point (8,9)

a) Sketch the circle

b) Find the radius length of the circle

c) Write down the equation of the circle

Question 3

The line segment joining A(-5,3) and B(5,-3) is the diameter of a circle

a) Sketch the circle

b) Find the centre of the circle

c) Find the radius length of the circle

d) Write down the equation of the circle

e) Using the formula Area = πr^2 find the area of the circle. Give your answer correct to two decimal places.

f) Find the area of the square in which the circle can be inscribed

Question 4

The equations of two circles are:

$$c_1 : x^2 + y^2 - 6x - 10y + 29 = 0$$

$$c_2 : x^2 + y^2 - 2x - 2y - 43 = 0$$

a) Write down the centre and radius-length of each circle.

b) Prove that the circles are touching.

c) Verify that (4, 7) is the point that they have in common.

d) Find the equation of the common tangent.

Question 5

A circle passes through the point (3,3) and the point (4,1).

If the centre of the circle is on the line x + 3y = 12, find its equation.

NB: Draw a rough sketch of the circle and the line above

Question 6

The line 3x -4y+14=0 is tangent to a circle at the point

(-2, 2). The circle also contains the point (5,1)

a) Draw a rough sketch of the circle.

b) Find the equation of the circle.

Question 7

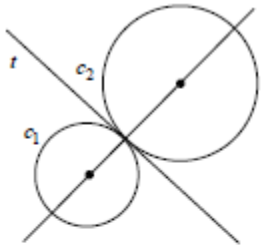
(a) Draw the circle $c: x^2 + y^2 = 25$. Show your scale on both axes.

(b) Verify, using algebra, that $A(-4, 3)$ is on c.

(c) Find the equation of the circle with centre $(-4, 3)$ that passes through the point $(3, 4)$.

Question 8

The circles c_1 and c_2 touch externally as shown.



(a) Complete the following table:

Circle	Centre	Radius	Equation
c_1	$(-3, -2)$	2	
c_2			$x^2 + y^2 - 2x - 2y - 7 = 0$

(b) **(i)** Find the co-ordinates of the point of contact of c_1 and c_2.

(ii) Hence, or otherwise, find the equation of the tangent, t, common to c_1 and c_2.

Question 9

The centre of a circle lies on the line $x + 2y - 6 = 0$. The x-axis and the y-axis are tangents to the circle. There are two circles that satisfy these conditions. Find their equations.