Test - Straight lines and circles

Year: Year 12 · Duration: 60 minutes · /20

Name:	Date:	**Mark: /20**

Question	1	2	3	4	5	Total
marks	4	4	4	3	5	**20**
Mark						

Show your working.

Question 1 (4 marks)

Question 1 – Lines

$A(1, 3)$ and $B(5, 11)$.

a. Find the equation of the line AB in the form $y = mx + c$. (2 marks)
b. Find the equation of the perpendicular bisector of AB. (2 marks)

Question 2 (4 marks)

Question 2 – Circle equation

A circle has equation $x^2 + y^2 - 10x + 4y + 13 = 0$.

a. Find the centre and the radius. (3 marks)
b. Determine whether $(1, -1)$ lies inside, outside or on the circle. (1 mark)

Question 3 (4 marks)

Question 3 – Tangent

The point $P(7, 1)$ lies on the circle $(x - 3)^2 + (y + 2)^2 = 25$.

a. Show that P lies on the circle. (1 mark)
b. Find the equation of the tangent at P. (3 marks)

Question 4 (3 marks)

Question 4 – Line and circle

The line $y = x + k$ meets the circle $x^2 + y^2 = 8$. Find the values of k for which the line is a tangent.

Question 5 (5 marks)

Question 5 – Problem: a circular skate park

On a plan, the ends of a diameter of a circular skate park are $A(2, 3)$ and $B(10, 9)$ (metres). A kiosk is at $C(9, 10)$.

a. Find the centre and radius of the skate park and write down its equation. (3 marks)
b. Show that the kiosk lies on the boundary. (1 mark)
c. Show that angle ACB is 90°. (1 mark)