Test - Equation of a circle and tangents

Year: Year 11 · Duration: 45 minutes · /20

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

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

Show your working.

Question 1 (4 marks)

Question 1 – Equation of a circle (Higher)

A circle has centre $(-2, 5)$ and radius 3.

a. Write down its equation. (2 marks)
b. Show that $(1, 5)$ is on the circle. (2 marks)

Question 2 (4 marks)

Question 2 – Tangent (Higher)

The point $A(4, 3)$ is on the circle $x^2 + y^2 = 25$.

a. Find the gradient of the tangent at A. (2 marks)
b. Find the equation of the tangent in the form $4x + 3y = c$. (2 marks)

Question 3 (4 marks)

Question 3 – Line and circle (Higher)

A line $y = x + 1$ meets the circle $x^2 + y^2 = 13$.

a. Show that $x^2 + x - 6 = 0$. (2 marks)
b. Find the coordinates of the two points of intersection. (2 marks)

Question 4 (4 marks)

Question 4 – Tangent length (Higher)

T is the point $(10, 0)$ and a circle has equation $x^2 + y^2 = 36$. TA is a tangent to the circle.

a. Work out the length TA. (3 marks)
b. Work out angle ATO. (1 mark)

Question 5 (4 marks)

Question 5 – Problem: tangent to a shifted circle (Higher)

The point $P(5, 5)$ is on the circle $(x - 3)^2 + (y + 1)^2 = 40$.

a. Find the gradient of the radius to P. (1 mark)
b. Find the equation of the tangent at P. (3 marks)