First Year Maths and Further Maths combined Test A8
Circles
30 minutes

Throughout the entire test all working must be shown and solutions based entirely on graphical or numerical methods may not be acceptable.

1.

A circle with centre $C(5, -3)$ passes through the point $A(-2, 1)$.

(a) Find the equation of the circle in the form

$$(x-a)^2 + (y-b)^2 = k$$

[3 marks]

(b) Given that AB is a diameter of the circle, find the coordinates of the point B.

[2 marks]

(c) Find an equation of the tangent to the circle at the point A, giving your answer in the form $px + qy + r = 0$, where p, q and r are integers.

[5 marks]

(d) The point T lies on the tangent to the circle at A such that $AT = 4$.

Find the length of CT.

[3 marks]

2.

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

(i) Find the coordinates of C and the radius of the circle. **[3]**

(ii) Show that the tangent to the circle at the point P (8, 2) has equation $3x+4y=32$. **[5]**

(iii) The circle meets the y-axis at Q and the tangent meets the y-axis at R. Find the area of triangle PQR. **[4]**
