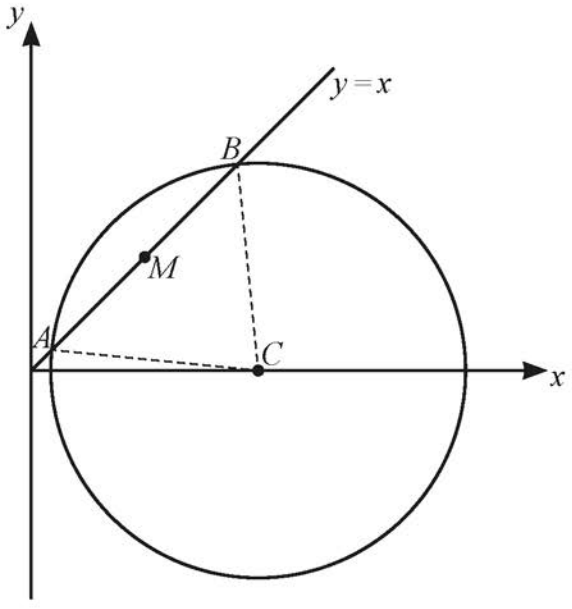
6 A circle has centre C which lies on the x-axis, as shown in the diagram. The line $y = x$ meets the circle at A and B. The midpoint of AB is M.



The equation of the circle is $x^2 - 6x + y^2 + a = 0$, where a is a constant.

(a) In this question you must show detailed reasoning.

Show that the area of triangle ABC is $\frac{3}{2}\sqrt{9-2a}$. **[7]**

(b) (i) Find the value of a when the area of triangle ABC is zero. **[1]**

(ii) Give a geometrical interpretation of the case in part **(b)(i)**. **[1]**

(c) Give a geometrical interpretation of the case where $a = 5$. **[1]**