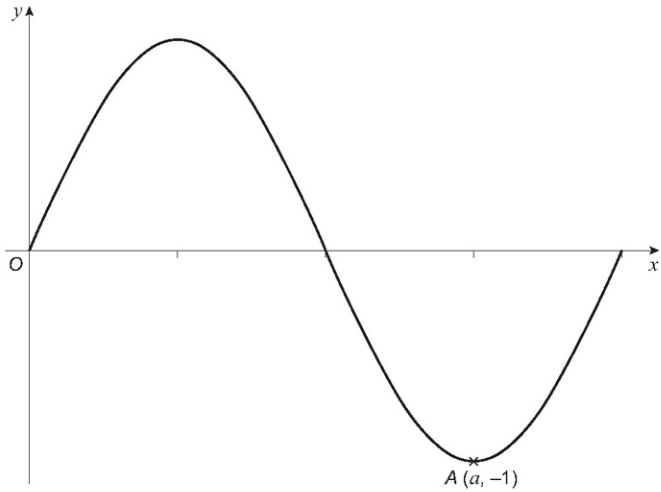
**6** Part of the graph of $y = \sin x$ is shown in **Figure 1**

**Figure 1**




**6 (a) (i)** The point $A$ has coordinates $(a, -1)$, where $a$ is in radians.

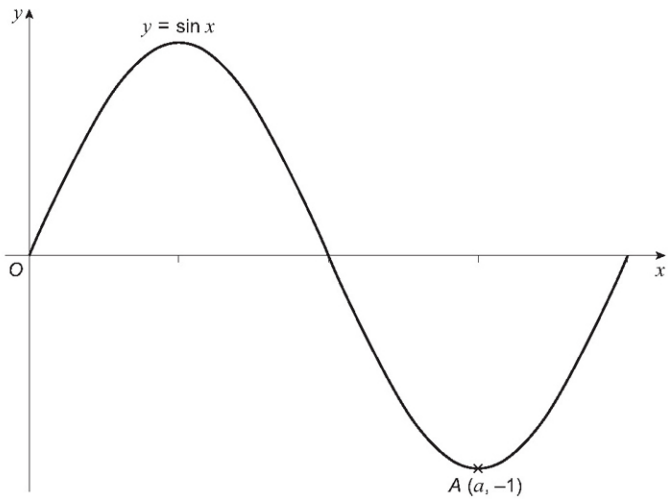
State the exact value of $a$

**[1 mark]**

**6 (a) (ii)** On **Figure 2** sketch the graph with equation $y = \sin 2x$

**[1 mark]**

**Figure 2**




**6 (b)** Show that the equation

$$2\cos^2 2x + 5\sin 2x + 5 = 0$$

has only one solution in the interval $0 \leq x \leq \pi$ **and** state the exact value of this solution.

Fully justify your answer.

**[5 marks]**