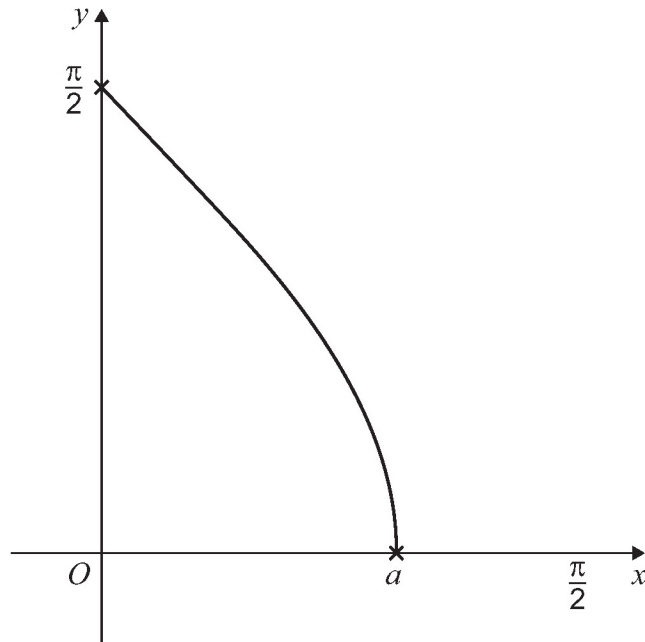


13

The function f is defined by

$$f(x) = \arccos x \text{ for } 0 \leq x \leq a$$

The curve with equation $y = f(x)$ is shown below.



13 (a) State the value of a

[1 mark]

13 (b) (i) On the diagram above, sketch the curve with equation

$$y = \cos x \text{ for } 0 \leq x \leq \frac{\pi}{2}$$

and

sketch the line with equation

$$y = x \text{ for } 0 \leq x \leq \frac{\pi}{2}$$

[4 marks]

13 (b) (ii) Explain why the solution to the equation

$$x - \cos x = 0$$

must also be a solution to the equation

$$\cos x = \arccos x$$

[1 mark]

13 (c) Use the Newton-Raphson method with $x_0 = 0$ to find an approximate solution, x_3 , to the equation

$$x - \cos x = 0$$

Give your answer to four decimal places.

[3 marks]