

Cambridge International AS & A Level

Mathematics 9709

Paper 1 Pure Mathematics 1

Topic 5-Trigonometry

Question No (19)

<http://kingcambridgesolutions.com>

WhatsApp +923454231525

Rs:300/Paper

Question No (19)

- (i) Sketch, on the same diagram, the graphs of $y = \sin x$ and $y = \cos 2x$ for $0^\circ \leq x \leq 180^\circ$.
- (ii) Verify that $x = 30^\circ$ is a root of the equation $\sin x = \cos 2x$, and state the other root of this equation for which $0^\circ \leq x \leq 180^\circ$.
- (iii) Hence state the set of values of x , for $0^\circ \leq x \leq 180^\circ$, for which $\sin x < \cos 2x$.

Solution

On Next page

(34)

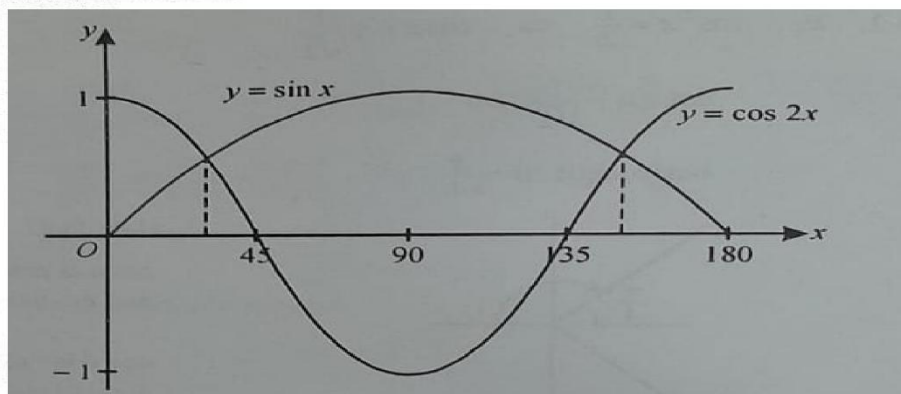
(i)

$$y = \sin x$$

x	0	45	90	135	180
y	0	$\frac{1}{\sqrt{2}}$	1	0.707	0

$$y = \cos 2x$$

x	0	45	90	135	180
y	1	0	-1	0	1



(ii)

$$\sin x = \cos 2x$$

$$y = \sin x$$

$$y = \cos 2x$$

$$\text{at } x = 30$$

$$y = \sin 30$$

$$y = \cos 60$$

$$y = \frac{1}{2}$$

$$y = \frac{1}{2}$$

As value of $\sin x = \cos 2x$ at $x = 30$

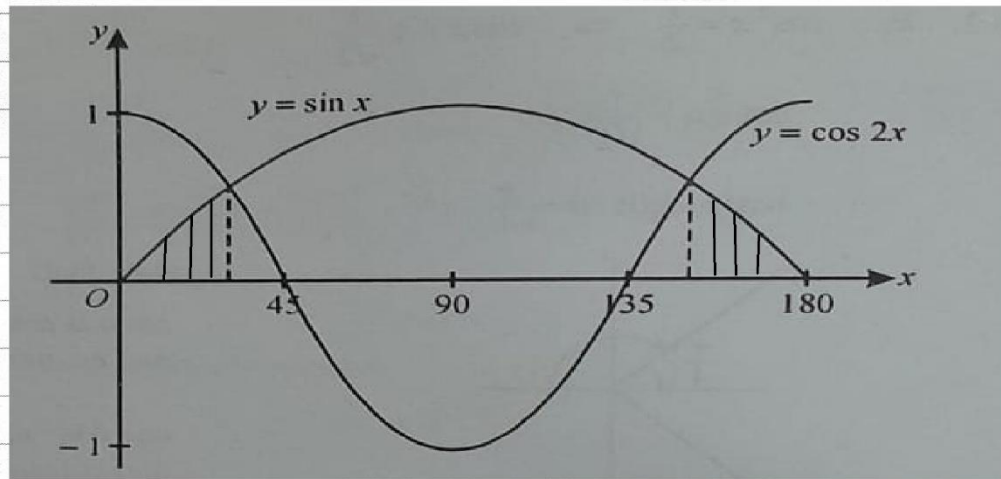
So this is the root -

From the graph of (i) $x = 150$ is the other root.

DATE :-

(35)

(u)



from graph $\sin x$ is less than $\cos 2x$
 i.e. $\sin x < \cos 2x$ in
 $0 \leq x \leq 30$ and $150 \leq x \leq 180^\circ$