Exemplar Problem

Trigonometry Functions

Example 17: The greatest value of $\sin x \cos x$ is

a) 1

b) 2

c) $\sqrt{2}$

d) $\frac{1}{2}$

Ans: The correct answer is option (d) $\frac{1}{2}$

We have, $\sin x \cos x$

Multiply and divide the expression by 2

$\Rightarrow \frac{1}{2} \times 2\sin x \cos x$

We know that $2\sin x \cos x = \sin 2x$. Therefore, we get

$$\Rightarrow \frac{1}{2} \times \sin 2x$$

We know that,

$\Rightarrow -1 \leqslant \sin 2x \leqslant 1$

Divide the expression by 2

$\Rightarrow -\frac{1}{2} \leqslant \frac{\sin 2x}{2} \leqslant \frac{1}{2}$

Hence, the greatest is $\frac{1}{2}$.