

Question #51816

Without using tables, find the value of $\sin 600^\circ \cos 600^\circ$.

Solution.

Using double angle formula for sin, we have:

$$\sin 600^\circ \cos 600^\circ = \frac{1}{2} \cdot 2 \cdot \sin 600^\circ \cos 600^\circ = \frac{1}{2} \cdot \sin 2 \cdot 600^\circ = \frac{1}{2} \sin 1200^\circ$$

$$\frac{1}{2} \sin 1200^\circ = \frac{1}{2} \sin(1080^\circ + 120^\circ)$$

Using, that sine has the smallest positive period 360° , we can rewrite:

$$\frac{1}{2} \sin(1080^\circ + 120^\circ) = \frac{1}{2} \sin(3 \cdot 360^\circ + 120^\circ) = \frac{1}{2} \sin 120^\circ = \frac{1}{2} \sin(180^\circ - 60^\circ) = \frac{1}{2} \sin 60^\circ$$

$$\frac{1}{2} \sin 60^\circ = \frac{1}{2} \cdot \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{4}$$

Answer: $\frac{\sqrt{3}}{4}$.