

13) Știind că $\sin x = \frac{1}{2} + \cos x$ determinați $\sin 2x$

Fie

$$\begin{cases} \sin x = a \\ \cos x = b \end{cases}$$

$$\begin{cases} a = \frac{1}{2} + b \\ a^2 + b^2 = 1 \end{cases}$$

$$\left(\frac{1}{2} + b\right)^2 + b^2 = 1$$

$$\frac{1}{4} + b + 2b^2 = 1$$

$$2b^2 + b = 1 - \frac{1}{4}$$

$$2b^2 + b = \frac{3}{4}$$

$$a = \frac{1}{2} + b$$

$$2ab = b + 2b^2$$

$$2ab = \frac{3}{4}$$

$$\sin 2x = 2 \sin x \cos x = 2ab = \frac{3}{4}$$