

Answer on QUESTION #55951 – Math – Trigonometry

Prove that $\sin(40 + x) * \cos(10 + x) - \cos(40 + x) * \sin(10 + x) = \frac{1}{2}$

SOLUTION

First of all we recall a formula of trigonometry:

$$\sin(\alpha) * \cos(\beta) - \cos(\alpha) * \sin(\beta) = \sin(\alpha - \beta)$$

in our case $\alpha = 40 + x$ and $\beta = 10 + x$

Now apply the formula to our case

$$\begin{aligned} \sin(40 + x) * \cos(10 + x) - \cos(40 + x) * \sin(10 + x) &= \sin((40 + x) - (10 + x)) = \\ &= \sin(40 + x - 10 - x) = \sin(30) = \frac{1}{2} \end{aligned}$$

REMARK

The solution is true only in the case where the argument is recorded in degrees.

If the argument records in radians, then $\sin(30) = -0.988031$.