Conditions

1) If tan x = .76 and cos x = .22, what is sin x?
2) If sin x = .42, what is cos x?

Solution

1)

This is a trigonometric task. Here we must use the Basic Trigonometric Identity. Its formula is:

$$sin^2(x) + cos^2(x) = 1, x \in R.$$

As it known, $\tan(x) = \frac{\sin(x)}{\cos(x)}$, so

$\frac{\sin(x)}{\cos(x)} = 0{,}76 \Rightarrow \sin(x) = 0{,}76\cos(x)$. $\cos(x) = 0{,}22 \Rightarrow \sin(x) = 0{,}76 \times 0{,}22 = 0{,}1672$

2)

This task is logically near previous. We use the same formula:

$$sin^2(x) + cos^2(x) = 1, x \in R.$$

$sin^2(x) + cos^2(x) = (0{,}42)^2 + cos^2(x) = 1 \Rightarrow cos^2(x) = 1 - 0{,}1764 = 0{,}8236$

$\Rightarrow \cos(x) = \pm\sqrt{0{,}8236}$

This value is irrational, so we can leave it in this form.

Answer:

1) $\sin(x) = 0{,}1672$
2) Two solutions: $\cos(x) = \sqrt{0{,}8236}$ *or* $\cos(x) = -\sqrt{0{,}8236}$