

Answer on Question #57482 – Math – Trigonometry

Question

Express the number $\tan(\arcsin(24/25))$ in the form of a reduced fraction p/q (such as $2/3$, $4/5$, $-1/4$, etc.) with $q > 0$ and give the integers p and q .

Solution

$$\begin{aligned}\tan\left(\arcsin\frac{24}{25}\right) &= \frac{\sin\left(\arcsin\frac{24}{25}\right)}{\cos\left(\arcsin\frac{24}{25}\right)} = \frac{\frac{24}{25}}{\sqrt{1 - \sin^2\left(\arcsin\frac{24}{25}\right)}} = \\ &= \frac{\frac{24}{25}}{\sqrt{1 - \left(\frac{24}{25}\right)^2}} = \frac{\frac{24}{25}}{\sqrt{1 - \frac{576}{625}}} = \frac{\frac{24}{25}}{\sqrt{\frac{49}{625}}} = \frac{24}{7} = \frac{p}{q}\end{aligned}$$

Answer: $24/7$, $p=24$, $q=7$.