

$$\operatorname{tg}\left(\frac{1}{2} \cdot \arccos\left(\frac{3}{5}\right) - 2 \operatorname{arccotg}(-2)\right)$$

исп универсальная тригонометрическая подстановка

$$\operatorname{ctgx} = -2 \quad x \in \left(-\frac{\pi}{2}; \frac{\pi}{2}\right)$$

$$\cos y = \frac{3}{5} \quad y \in [0; \pi]$$

$$\operatorname{tg}\left(\frac{1}{2}y - 2x\right) = \frac{\operatorname{tg}\left(\frac{y}{2}\right) + \operatorname{tg}(-2x)}{1 - \operatorname{tg}\left(\frac{1}{2}y\right) \operatorname{tg}(-2x)}$$

$$\operatorname{tg}\frac{1}{2}y = \frac{\sin\frac{1}{2}y}{\cos\frac{1}{2}y}$$

$$\sin y = \sqrt{1 - \cos^2 y} = \frac{4}{5}$$

$$\cos\left(\frac{y}{2}\right) = \sqrt{\cos\frac{y}{2} + \frac{1}{2}} = \sqrt{\frac{3}{10} + \frac{5}{10}} = \frac{2}{\sqrt{5}}$$

$$\sin\left(\frac{y}{2}\right) = \frac{\sqrt{5}}{5} = \frac{1}{\sqrt{5}}$$

$$\operatorname{tg}\left(\frac{y}{2}\right) = \frac{1}{2}$$

$$\operatorname{ctgx} = -2 \Rightarrow \operatorname{ctg}(-x) = 2$$

$$\operatorname{tg}(-2x) = \frac{2 \operatorname{tg}(-x)}{1 - \operatorname{tg}(-x)^2} = \frac{4}{3}$$

$$\operatorname{tg}\left(\frac{1}{2}y - 2x\right) = \frac{\frac{1}{2} + \frac{4}{3}}{1 - \left(\frac{4}{3} \cdot \frac{1}{2}\right)} = \frac{-\frac{5}{6}}{\frac{10}{6}} = -\frac{11}{2}$$

$$\sin(\arccos x) = ?$$

$$\arccos x = t \quad t \in [0; \pi]$$

$$\cos t = x$$

$$\sin t = \sqrt{1 - x^2}$$

$$\sin(\operatorname{arctg} x) = ?$$

$$\operatorname{arctg} x = t \quad t \in \left(-\frac{\pi}{2}; \frac{\pi}{2}\right)$$

$$\operatorname{tg} t = x$$

$$1 + \operatorname{tg}^2 k = \frac{1}{\cos^2 k} = \frac{1}{(-\sin^2 k + 1)} \Rightarrow 1 - \sin^2 k = \frac{1}{1 + \operatorname{tg}^2 k} \Rightarrow$$

$$\sin k = \pm \sqrt{1 - \frac{1}{1 + \operatorname{tg}^2 k}}$$

$$\sin t = \pm \sqrt{1 - \frac{1}{1 + x^2}} = \pm \sqrt{\frac{x^2}{1 + x^2}}$$

$$\text{при } t \in \left(-\frac{\pi}{2}; 0\right] \quad \sin t < 0 \quad \sin t = -\sqrt{\frac{x^2}{1 + x^2}} = -\frac{|x|}{\sqrt{1 + x^2}}$$

$$= \frac{x}{\sqrt{1 + x^2}}$$

$$\text{при } t \in \left(0; \frac{\pi}{2}\right) \quad \sin t > 0 \quad \sin t = \sqrt{\frac{x^2}{1 + x^2}} = \frac{|x|}{\sqrt{1 + x^2}}$$

$$= \frac{x}{\sqrt{1 + x^2}}$$

