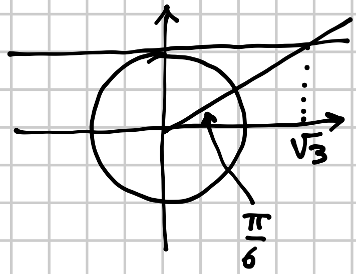
502 $\arccos(-1)+\arcsin\left(-\frac{1}{2}\right)-\operatorname{arccot}\sqrt{3}$ $\left[\frac{2}{3}\pi\right]$



$$= \pi - \frac{\pi}{6} - \frac{\pi}{6} = \pi - \frac{\pi}{3} = \frac{2}{3}\pi$$

1. Calcolare $\sin\left(\arctan\frac{4}{3}\right)$; $\cos\left(\arctan\frac{4}{3}\right)$. $\left[\frac{4}{5};\frac{3}{5}\right]$

$$\tan\alpha = \frac{\sin\alpha}{\cos\alpha} \Rightarrow \tan^2\alpha = \frac{\sin^2\alpha}{\cos^2\alpha} \longrightarrow \tan^2\alpha = \frac{\sin^2\alpha}{1-\sin^2\alpha}$$

$$\tan^2\alpha = \frac{1-\cos^2\alpha}{\cos^2\alpha}$$

$$\Downarrow$$

$$\cos^2\alpha\tan^2\alpha = 1-\cos^2\alpha$$

$$\cos^2\alpha\tan^2\alpha + \cos^2\alpha = 1$$

$$\cos^2\alpha\left(1+\tan^2\alpha\right) = 1$$

$$\boxed{\cos^2\alpha = \frac{1}{1+\tan^2\alpha}}$$

$$\boxed{\sin^2\alpha = \frac{\tan^2\alpha}{1+\tan^2\alpha}}$$

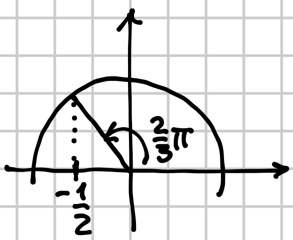
$$\sin\left(\arctan\frac{4}{3}\right) = +\sqrt{\frac{\tan^2\left(\arctan\frac{4}{3}\right)}{1+\tan^2\left(\arctan\frac{4}{3}\right)}} = \sqrt{\frac{\left(\frac{4}{3}\right)^2}{1+\left(\frac{4}{3}\right)^2}} = \frac{\frac{4}{3}}{\sqrt{1+\frac{16}{9}}} =$$

$$= \frac{\frac{4}{3}}{\sqrt{\frac{25}{9}}} = \frac{4}{3}\cdot\frac{3}{5} = \boxed{\frac{4}{5}}$$

$$\cos\left(\arctan\frac{4}{3}\right) = +\frac{1}{\sqrt{1+\tan^2\left(\arctan\frac{4}{3}\right)}} = \frac{1}{\sqrt{1+\left(\frac{4}{3}\right)^2}} = \frac{1}{\sqrt{1+\frac{16}{9}}} =$$

$$= \frac{1}{\sqrt{\frac{25}{9}}} = \frac{3}{5}$$

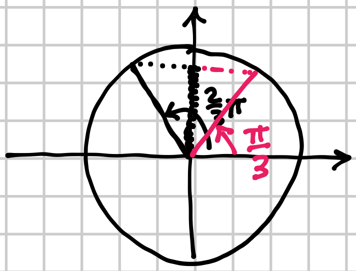
2. Calcolare $\sin\left[\arccos\left(-\frac{1}{2}\right)\right]$; $\sin\left[\arcsin\left(-\frac{5}{13}\right)\right]$. $\left[\frac{\sqrt{3}}{2}; \ldots\right]$



$$\sin\left[\arccos\left(-\frac{1}{2}\right)\right] = \sin\left(\frac{2}{3}\pi\right) = \frac{\sqrt{3}}{2}$$

$$\sin\left[\arcsin\left(-\frac{5}{13}\right)\right] = -\frac{5}{13}$$

$$\cancel{\arcsin\left(\sin\frac{2}{3}\pi\right)} = \frac{2}{3}\pi \quad \text{perché} \quad \frac{2}{3}\pi \notin \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$$



$$\arcsin\left(\sin\frac{2}{3}\pi\right) =$$

$$= \arcsin\left(\frac{\sqrt{3}}{2}\right) = \frac{\pi}{3}$$

$$\arcsin\left(\sin\frac{\pi}{6}\right) = \frac{\pi}{6} \quad \text{perché} \quad \frac{\pi}{6} \in \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$$

3. Calcolare $\cos\left[\arcsin\left(-\frac{\sqrt{3}}{4}\right)\right]$; $\arcsin\left(\sin\frac{5}{2}\pi\right)$; $\tan\left(\arcsin\frac{\sqrt{5}}{5}\right)$. $\left[\frac{\sqrt{13}}{4}; \frac{\pi}{2}; \frac{1}{2}\right]$

$$\cos\left[\arcsin\left(-\frac{\sqrt{3}}{4}\right)\right] =$$

$$= \sqrt{1-\sin^2\left(\arcsin\left(-\frac{\sqrt{3}}{4}\right)\right)} =$$

$$= \sqrt{1-\left(-\frac{\sqrt{3}}{4}\right)^2} = \sqrt{1-\frac{3}{16}} = \boxed{\frac{\sqrt{13}}{4}}$$

$$\cos^2\alpha + \sin^2\alpha = 1$$

$$\cos^2\alpha = 1-\sin^2\alpha$$

$$\cos\alpha = \pm\sqrt{1-\sin^2\alpha}$$

$$\arcsin\left(\sin\frac{5}{2}\pi\right) = \arcsin\left(\sin\left(\frac{\pi}{2}+2\pi\right)\right) = \arcsin\left(\sin\frac{\pi}{2}\right) = \boxed{\frac{\pi}{2}}$$

$$\tan\left(\arcsin\frac{\sqrt{5}}{5}\right) = \frac{\sin\left(\arcsin\frac{\sqrt{5}}{5}\right)}{\cos\left(\arcsin\frac{\sqrt{5}}{5}\right)} = \frac{\frac{\sqrt{5}}{5}}{\sqrt{1-\sin^2\arcsin\frac{\sqrt{5}}{5}}} =$$

$$= \frac{\frac{\sqrt{5}}{5}}{\sqrt{1-\frac{5}{25}}} = \frac{\frac{\sqrt{5}}{5}}{\sqrt{1-\frac{1}{5}}} = \frac{\frac{\sqrt{5}}{5}}{\frac{2}{\sqrt{5}}} = \frac{\sqrt{5}}{5}\cdot\frac{\sqrt{5}}{2} = \boxed{\frac{1}{2}}$$