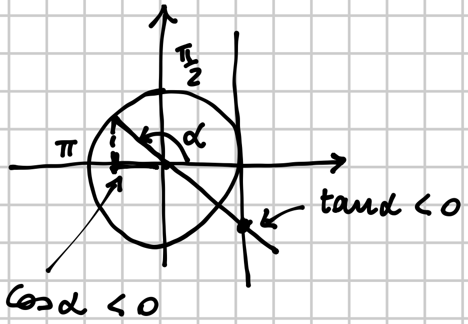
CALCOLARE SAPENDO CHE: 28/9/2022

288 $\cos\alpha$ e $\tan\alpha$; $\sin\alpha = \frac{5}{13}$, $\frac{\pi}{2} < \alpha < \pi$.

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

VIENE DECISO DAL QUADRANTE CHE CORRISPONDE AD α

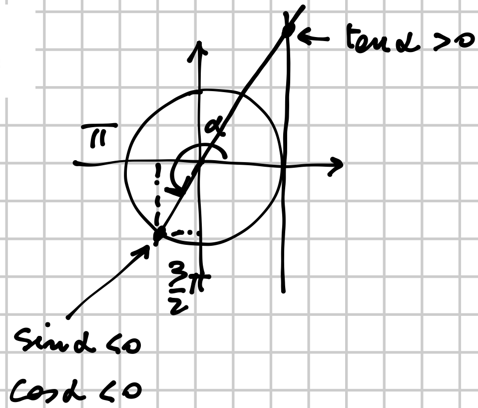


$$\cos\alpha = -\sqrt{1-\sin^2\alpha} = -\sqrt{1-\left(\frac{5}{13}\right)^2} =$$

$$= -\sqrt{1-\frac{25}{169}} = -\sqrt{\frac{144}{169}} = -\frac{12}{13}$$

$$\tan\alpha = \frac{\sin\alpha}{\cos\alpha} = \frac{\frac{5}{13}}{-\frac{12}{13}} = -\frac{5}{12}$$

289 $\sin\alpha$ e $\tan\alpha$; $\cos\alpha = -\frac{33}{65}$, $\pi < \alpha < \frac{3}{2}\pi$.



$$\sin\alpha = -\sqrt{1-\left(-\frac{33}{65}\right)^2} =$$

$$= -\sqrt{1-\frac{1089}{4225}} =$$

$$= -\sqrt{\frac{3136}{4225}} = -\frac{56}{65}$$

$$\tan\alpha = \frac{\sin\alpha}{\cos\alpha} = \frac{-\frac{56}{65}}{-\frac{33}{65}} = \frac{56}{33}$$

326 $\frac{1}{2}\sec 45° - \cos 45° - 2\cos^2 30° + \sqrt{3}\csc 60° - 3\tan 30° + 3\cot 60° =$

$$= \frac{1}{2}\cdot\frac{1}{\cos 45°} - \frac{\sqrt2}{2} - 2\left(\frac{\sqrt3}{2}\right)^2 + \sqrt3\cdot\frac{1}{\sin 60°} - 3\cdot\frac{\sqrt3}{3} + 3\cdot\frac{1}{\tan 60°} =$$

$$= \frac{1}{2}\cdot\frac{2}{\sqrt2} - \frac{\sqrt2}{2} - 2\cdot\frac{3}{4} + \sqrt3\cdot\frac{1}{\frac{\sqrt3}{2}} - \sqrt3 + 3\cdot\frac{1}{\sqrt3} =$$

$$= \cancel{\frac{1}{\sqrt2}} - \cancel{\frac{\sqrt2}{2}} - \frac{3}{2} + 2 - \cancel{\sqrt3} + \cancel{\frac{3}{\sqrt3}} =$$

$\frac{3}{\sqrt3} = \sqrt3$

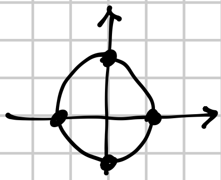
$\frac{1}{\sqrt2} = \frac{\sqrt2}{2}$

$$= -\frac{3}{2} + 2 = \boxed{\frac{1}{2}}$$

VERIFICARE L'IDENTITÀ

303 $(\cot\alpha - \cos\alpha)\cdot\tan\alpha \overset{?}{=} 1 - \sin\alpha$

$\alpha \neq k\frac{\pi}{2}$



$$\left(\frac{\cos\alpha}{\sin\alpha} - \cos\alpha\right)\cdot\frac{\sin\alpha}{\cos\alpha} \overset{?}{=} 1 - \sin\alpha$$

$$\frac{\cancel{\cos}\alpha}{\cancel{\sin}\alpha}\cdot\frac{\cancel{\sin}\alpha}{\cancel{\cos}\alpha} - \cancel{\cos}\alpha\cdot\frac{\sin\alpha}{\cancel{\cos}\alpha} \overset{?}{=} 1 - \sin\alpha$$

$$1 - \sin\alpha = 1 - \sin\alpha \quad \text{OK!}$$

VERIFICARE L'IDENTITÀ

309 $\cos^2\alpha - \sin^2\alpha = \dfrac{1-\tan^2\alpha}{1+\tan^2\alpha}$

$\alpha \neq \frac{\pi}{2} + k\pi$

$$(1+\tan^2\alpha)(\cos^2\alpha - \sin^2\alpha) = 1-\tan^2\alpha$$

$$\left(1+\frac{\sin^2\alpha}{\cos^2\alpha}\right)(\cos^2\alpha - \sin^2\alpha) = 1-\tan^2\alpha$$

$$\left(\frac{\overbrace{\cos^2\alpha+\sin^2\alpha}^{1}}{\cos^2\alpha}\right)(\cos^2\alpha - \sin^2\alpha) = 1-\tan^2\alpha$$

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

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

ALTERNATIVAMENTE

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

$$\cos^2\alpha - \sin^2\alpha = \frac{1-\dfrac{\sin^2\alpha}{\cos^2\alpha}}{1+\dfrac{\sin^2\alpha}{\cos^2\alpha}}$$

$$\cos^2\alpha - \sin^2\alpha = \frac{\dfrac{\cos^2\alpha-\sin^2\alpha}{\cancel{\cos^2\alpha}}}{\dfrac{\cos^2\alpha+\sin^2\alpha}{\cancel{\cos^2\alpha}}} \rightarrow 1$$

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