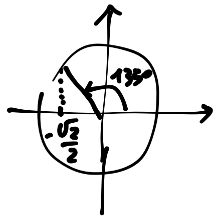
11/5/2018

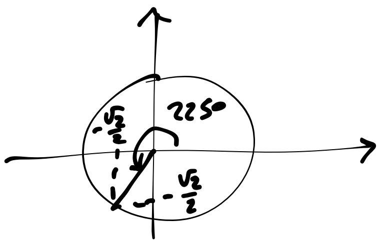
91 $\cos(\alpha + 135°) - \cos(225° - \alpha) + \cos(-\alpha) =$



$$= \cos\alpha \cos 135° - \sin\alpha \sin 135° - \left[\cos 225° \cos\alpha + \sin 225° \sin\alpha\right] +$$

$$+ \cos\alpha =$$

$$= \cos\alpha \left(-\frac{\sqrt{2}}{2}\right) - \sin\alpha \cdot \frac{\sqrt{2}}{2} - \left[\left(-\frac{\sqrt{2}}{2}\right)\cos\alpha + \left(-\frac{\sqrt{2}}{2}\right)\sin\alpha\right] + \cos\alpha =$$



$$= \cancel{-\frac{\sqrt{2}}{2}\cos\alpha} \cancel{- \frac{\sqrt{2}}{2}\sin\alpha} \cancel{+ \frac{\sqrt{2}}{2}\cos\alpha} \cancel{+ \frac{\sqrt{2}}{2}\sin\alpha} + \cos\alpha = \boxed{\cos\alpha}$$

93 $\cos 2\alpha + \mathrm{sen}\, 2\alpha \cdot \mathrm{tg}\,\alpha =$

$$\sin 2\alpha = 2\sin\alpha\cos\alpha$$

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

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

$$= \cos 2\alpha + 2\sin\alpha\cancel{\cos\alpha} \cdot \frac{\sin\alpha}{\cancel{\cos\alpha}} =$$

$$= \cos 2\alpha + 2\sin^2\alpha = 1 \cancel{- 2\sin^2\alpha} \cancel{+ 2\sin^2\alpha} = \boxed{1}$$

96 $\cos 2\alpha - \text{sen } 2\alpha + (\text{sen } \alpha + \cos \alpha)^2 =$

$$= \cos 2\alpha - \cancel{2 \sin\alpha \cos\alpha} + \sin^2\alpha + \cos^2\alpha + \cancel{2 \sin\alpha \cos\alpha} =$$

$$= \cos^2\alpha - \cancel{\sin^2\alpha} + \cancel{\sin^2\alpha} + \cos^2\alpha = \boxed{2\cos^2\alpha}$$

98 $\dfrac{1 - \cos 2\alpha}{1 + \cos 2\alpha} \cdot \text{cotg } \alpha =$

$$= \frac{1 - (1 - 2\sin^2\alpha)}{1 + (2\cos^2\alpha - 1)} \cdot \frac{\cos\alpha}{\sin\alpha} = \frac{\cancel{1} - \cancel{1} + 2\sin^2\alpha}{\cancel{1} + 2\cos^2\alpha - \cancel{1}} \cdot \frac{\cos\alpha}{\sin\alpha} =$$

$$= \frac{\cancel{2}\sin^{\cancel{2}}\alpha}{\cancel{2}\cos^{\cancel{2}}\alpha} \cdot \frac{\cancel{\cos}\alpha}{\cancel{\sin}\alpha} = \frac{\sin\alpha}{\cos\alpha} = \boxed{\tan\alpha}$$

99 $(1+\cos 2\alpha)\cdot(1+\operatorname{tg}\alpha)^2$ $[2(1+2\,\text{sen}\,\alpha\cos\alpha)]$

$$(\cancel{1}+2\cos^2\alpha-\cancel{1})(1+\tan^2\alpha+2\tan\alpha)=$$

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

$$=2\left[\cos^2\alpha+\cancel{\cos^2\alpha}\cdot\frac{\sin^2\alpha}{\cancel{\cos^2\alpha}}+2\cos^{\cancel{2}}\alpha\frac{\sin\alpha}{\cancel{\cos\alpha}}\right]=$$

$$=2[\underbrace{\cos^2\alpha+\sin^2\alpha}_{1}+2\cos\alpha\sin\alpha]=\boxed{2(1+2\cos\alpha\sin\alpha)}$$

104 $(\cos\alpha-\text{sen}\,\alpha)\cdot\dfrac{\cos 2\alpha}{\cos\alpha+\text{sen}\,\alpha}+2\,\text{sen}\,2\alpha=$

$[(\text{sen}\,\alpha+\cos\alpha)^2]$

$$=(\cos\alpha-\sin\alpha)\cdot\frac{\cos^2\alpha-\sin^2\alpha}{\cos\alpha+\sin\alpha}+2\sin 2\alpha=$$

$$=(\cos\alpha-\sin\alpha)\cdot\frac{(\cos\alpha-\sin\alpha)\cancel{(\cos\alpha+\sin\alpha)}}{\cancel{\cos\alpha+\sin\alpha}}+4\sin\alpha\cos\alpha=$$

$$=(\cos\alpha-\sin\alpha)^2+4\sin\alpha\cos\alpha=$$

$$A^2-B^2=(A-B)(A+B)$$

$$=\underbrace{\cos^2\alpha+\sin^2\alpha}_{1}-2\sin\alpha\cos\alpha+4\sin\alpha\cos\alpha$$

$$=\boxed{1+2\sin\alpha\cos\alpha}$$

106 $\cos\alpha = \frac{3}{4}$, con $0 < \alpha < \frac{\pi}{2}$. Calcola sen 2α, $\cos 2\alpha$, tg 2α.

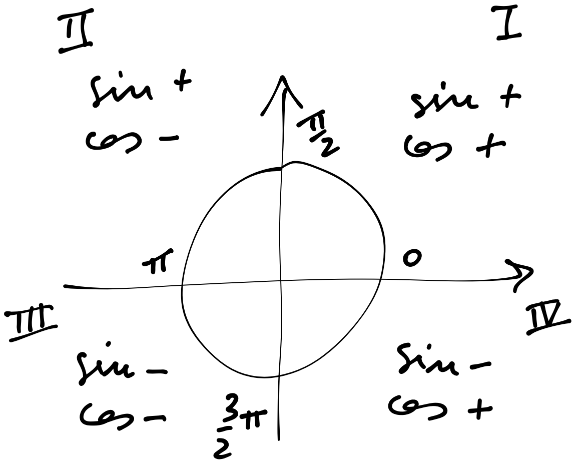
$$\sin\alpha = \sqrt{1-\cos^2\alpha} = \sqrt{1-\left(\frac{3}{4}\right)^2} = \sqrt{1-\frac{9}{16}} = \sqrt{\frac{16-9}{16}} = \frac{\sqrt{7}}{4}$$

+ perché $0<\alpha<\frac{\pi}{2}$

$$\sin 2\alpha = 2\sin\alpha\cos\alpha = \cancel{2}\cdot\frac{\sqrt{7}}{\cancel{4}_{\,2}}\cdot\frac{3}{4} = \boxed{\frac{3\sqrt{7}}{8}}$$

$$\cos 2\alpha = 2\cos^2\alpha - 1 = 2\left(\frac{3}{4}\right)^2 - 1 = \cancel{2}\cdot\frac{9}{\cancel{16}_{\,8}} - 1 = \frac{9}{8} - 1 = \boxed{\frac{1}{8}}$$

$$\tan 2\alpha = \frac{\sin 2\alpha}{\cos 2\alpha} = \frac{\frac{3\sqrt{7}}{8}}{\frac{1}{8}} = \boxed{3\sqrt{7}}$$



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

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

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

Per decidere se + o − devo sapere qual è il quadrante, cioè devo sapere in quale intervallo ricade x

$0 \le x \le \frac{\pi}{2} \to$ 1° quad.

$\frac{\pi}{2} \le x \le \pi \to$ 2° quad.

$\pi \le x \le \frac{3}{2}\pi \to$ 3° quad.

$\frac{3}{2}\pi \le x \le 2\pi \to$ 4° quad.