8/5/2018

$$\sin(\alpha+\beta) = \sin\alpha\cos\beta + \sin\beta\cos\alpha$$
$$\cos(\alpha+\beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$$

87 $\operatorname{sen}\left(\frac{\pi}{3}+x\right)+\cos\left(\frac{\pi}{6}+x\right) =$ pg. 524

$$= \sin\frac{\pi}{3}\cos x + \sin x\cos\frac{\pi}{3} + \cos\frac{\pi}{6}\cos x - \sin\frac{\pi}{6}\sin x =$$

$$= \frac{\sqrt{3}}{2}\cos x + \cancel{\frac{1}{2}\sin x} + \frac{\sqrt{3}}{2}\cos x - \cancel{\frac{1}{2}\sin x} =$$

$$= \left(\frac{\sqrt{3}}{2}+\frac{\sqrt{3}}{2}\right)\cos x = \boxed{\sqrt{3}\cos x}$$

$\tan(\pi+x) = \tan x \Rightarrow \tan(\pi-\alpha) = \tan(-\alpha) =$
$= -\tan\alpha$

69 $\operatorname{cosec}(\pi+\alpha)\operatorname{tg}(\pi-\alpha)+\cos(2\pi-\alpha)-\sec(-\alpha) =$

$$= \frac{1}{\sin(\pi+\alpha)}(-\tan\alpha) + \cos(-\alpha) - \frac{1}{\cos(-\alpha)} =$$

$$\cos(2\pi+x) = \cos(x)$$

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

$$= \cancel{\frac{1}{\cos\alpha}} + \cos\alpha - \cancel{\frac{1}{\cos\alpha}} = \boxed{\cos\alpha}$$

71 $\operatorname{tg}(-\alpha) + \cancel{\operatorname{tg}(180^\circ - \alpha)} + \operatorname{tg}(360^\circ - \alpha) - \cancel{\operatorname{tg}(180^\circ - \alpha)} =$

$= -\tan\alpha \cancel{-\tan\alpha} - \tan\alpha \cancel{+\tan\alpha} = -2\tan\alpha$

73 $\operatorname{sen}(90^\circ + \alpha)\operatorname{tg}(-\alpha) + \operatorname{sen}(90^\circ + \alpha)\operatorname{cotg}(90^\circ - \alpha) - \cos(-\alpha)\operatorname{sen}(90^\circ - \alpha) =$

$= \cos\alpha\left(-\tan\alpha\right) + \cos\alpha \dfrac{\cos(90^\circ - \alpha)}{\sin(90^\circ - \alpha)} - \cos\alpha \cdot \cos\alpha =$

$= -\cancel{\cos\alpha} \cdot \dfrac{\sin\alpha}{\cancel{\cos\alpha}} + \cancel{\cos\alpha} \cdot \dfrac{\sin\alpha}{\cancel{\cos\alpha}} - \cos^2\alpha \rightarrow [\cos\alpha]^2 =$

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

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88 $\operatorname{sen}\left(\dfrac{\pi}{3} - x\right) - \cos\left(\dfrac{\pi}{6} - x\right) =$

$= \sin\dfrac{\pi}{3}\cos x - \cos\dfrac{\pi}{3}\sin x - \left[\cos\dfrac{\pi}{6}\cos x + \sin\dfrac{\pi}{6}\sin x\right] =$

$= \dfrac{\sqrt{3}}{2}\cos x - \dfrac{1}{2}\sin x - \left[\dfrac{\sqrt{3}}{2}\cos x + \dfrac{1}{2}\sin x\right] =$

$= \cancel{\dfrac{\sqrt{3}}{2}\cos x} - \dfrac{1}{2}\sin x \cancel{- \dfrac{\sqrt{3}}{2}\cos x} - \dfrac{1}{2}\sin x =$

$= \boxed{-\sin x}$

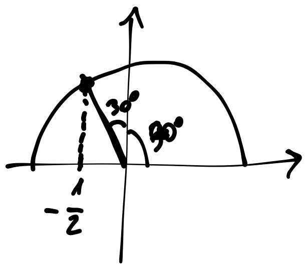
90 $\operatorname{sen}\left(\alpha+\overbrace{\frac{2}{3}\pi}^{\beta}\right)-\cos\left(\frac{\pi}{6}+\alpha\right)=$

$\sin(\alpha+\beta)=\sin\alpha\cos\beta+\cos\alpha\sin\beta$

$\cos(\alpha+\beta)=\cos\alpha\cos\beta-\sin\alpha\sin\beta$

$$=\sin\alpha\cos\frac{2}{3}\pi+\cos\alpha\sin\frac{2}{3}\pi-\left[\cos\frac{\pi}{6}\cos\alpha-\sin\frac{\pi}{6}\sin\alpha\right]=$$

$$=\sin\alpha\left(-\frac{1}{2}\right)+\cos\alpha\cdot\frac{\sqrt{3}}{2}-\frac{\sqrt{3}}{2}\cos\alpha+\frac{1}{2}\sin\alpha=0$$



$$\cos\left(\frac{2}{3}\pi\right)=\cos\left(\pi-\frac{\pi}{3}\right)=-\cos\frac{\pi}{3}=-\frac{1}{2}$$

FORMULE DI DUPLICAZIONE

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

$$\sin 2\alpha = \sin(\alpha + \alpha) = \sin\alpha\cos\alpha + \sin\alpha\cos\alpha =$$

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

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

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

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

$$= 1 - 2(1 - \cos^2\alpha) =$$

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

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

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