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$$\frac{\sin\left(\alpha-\frac{\pi}{2}\right)\sin(-\alpha)+\cos\left(\frac{3}{2}\pi-\alpha\right)\sin\left(\frac{11}{2}\pi+\alpha\right)+\cos(3\pi+\alpha)}{-\tan\left(\alpha+\frac{\pi}{2}\right)\cot\left(\alpha-\frac{3}{2}\pi\right)-\sin(\alpha+\pi)+\sin(7\pi-\alpha)}=$$

NON LO CONSIDERO

$$=\frac{\sin\left(-\left(\frac{\pi}{2}-\alpha\right)\right)(-\sin\alpha)+\cos\left(\pi+\left(\frac{\pi}{2}-\alpha\right)\right)\sin\left(\frac{\pi}{2}+(5\pi+\alpha)\right)+\cos(\cancel{2\pi}+\pi+\alpha)}{-(-\cot\alpha)\cot\left(\alpha-\frac{\pi}{2}-\cancel{\pi}\right)-(-\sin\alpha)+\sin(\cancel{6\pi}+\pi-\alpha)}=$$

non lo considero

$\cancel{4\pi}+\pi$

$$=\frac{-\sin\left(\frac{\pi}{2}-\alpha\right)(-\sin\alpha)-\cos\left(\frac{\pi}{2}-\alpha\right)\cos(5\pi+\alpha)-\cos\alpha}{\cot\alpha\cdot\cot\left(\alpha-\frac{\pi}{2}\right)+\sin\alpha+\sin\alpha}=$$

$$=\frac{\cos\alpha\cdot\sin\alpha-\sin\alpha\cdot(-\cos\alpha)-\cos\alpha}{\cot\alpha\cdot\underbrace{\cot\left(-\left(\frac{\pi}{2}-\alpha\right)\right)}_{\substack{-\cot\left(\frac{\pi}{2}-\alpha\right)\\ -\tan\alpha}}+2\sin\alpha}=$$

$$=\frac{\cos\alpha\sin\alpha+\cos\alpha\sin\alpha-\cos\alpha}{-\underbrace{\cot\alpha\cdot\tan\alpha}_{1}+2\sin\alpha}=$$

$$=\frac{2\cos\alpha\sin\alpha-\cos\alpha}{2\sin\alpha-1}=\frac{\cos\alpha\,(\cancel{2\sin\alpha-1})}{\cancel{2\sin\alpha-1}}=\boxed{\cos\alpha}$$

tenere presente che:

$\tan(\alpha+k\pi)=\tan\alpha$ $\quad\cot(\alpha+k\pi)=\cot\alpha$ $\quad\sin(\alpha+2k\pi)=\sin\alpha$

$k\in\mathbb{Z}$ $\quad\cos(\alpha+2k\pi)=\cos\alpha$

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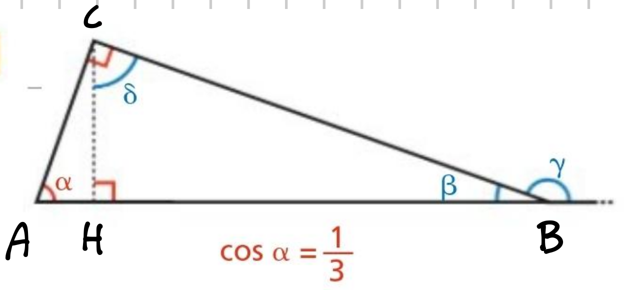

Trova cosβ, sinδ, sinγ. $\left[\frac{2}{3}\sqrt{2}; \frac{2}{3}\sqrt{2}; \frac{1}{3}\right]$

$\beta = \frac{\pi}{2} - \alpha$ angolo complementare di α perché ABC è rettangolo

$$\cos\beta = \cos\left(\frac{\pi}{2} - \alpha\right) = \sin\alpha = +\sqrt{1-\cos^2\alpha} = \sqrt{1-\frac{1}{9}} = \sqrt{\frac{8}{9}} = 2\frac{\sqrt{2}}{3}$$

+ perché α è acuto

$$\delta = \frac{\pi}{2} - \beta$$

$$\sin\delta = \sin\left(\frac{\pi}{2} - \beta\right) = \cos\beta = \frac{2}{3}\sqrt{2}$$

$$\gamma = \pi - \beta$$

$$\sin\gamma = \sin(\pi - \beta) = \sin\beta = \sqrt{1-\cos^2\beta} = \sqrt{1-\frac{8}{9}} = \sqrt{\frac{1}{9}} = \frac{1}{3}$$

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

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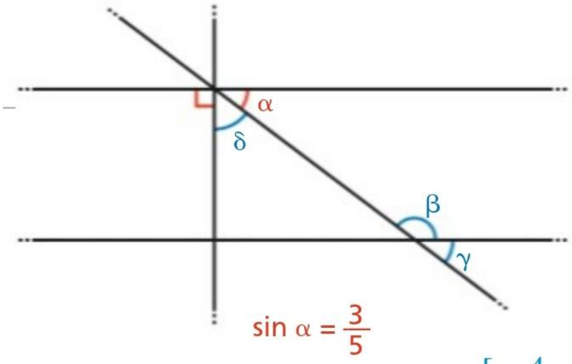

Trova $\cos\beta$, $\tan\gamma$, $\sin\delta$. $\left[-\frac{4}{5}; \frac{3}{4}; \frac{4}{5}\right]$

$$\alpha + \beta = \pi$$

$$\alpha + \delta = \frac{\pi}{2}$$

$$\gamma = \alpha$$

$$\beta = (\pi - \alpha) \Rightarrow \cos\beta = \cos(\pi - \alpha) = -\cos\alpha$$

$$\cos\alpha = \sqrt{1 - \sin^2\alpha} = \sqrt{1 - \frac{9}{25}} = \frac{4}{5}$$

$$\cos\beta = -\cos\alpha = -\frac{4}{5}$$

$$\tan\gamma = \tan\alpha = \frac{\sin\alpha}{\cos\alpha} = \frac{\frac{3}{5}}{\frac{4}{5}} = \frac{3}{4}$$

$$\delta = \frac{\pi}{2} - \alpha \Rightarrow \sin\delta = \sin\left(\frac{\pi}{2} - \alpha\right) = \cos\alpha = \frac{4}{5}$$