Sum + Difference Identities

$\cos(A+B) = \cos A \cos B - \sin A \sin B$

$\cos(30^\circ + 60^\circ) = \cos 30^\circ \cos 60^\circ - \sin 30^\circ \sin 60^\circ$

$0 = \frac{\sqrt{3}}{2} \cdot \frac{1}{2} - \frac{1}{2} \cdot \frac{\sqrt{3}}{2}$

$\cos(30^\circ + 60^\circ) = \cos 30^\circ + \cos 60^\circ$

$\cos 90^\circ = \sqrt{3}/2 + 1/2$

0

T or F

F $\sin 70^\circ = \sin 20^\circ \cos 50^\circ - \cos 20^\circ \sin 50^\circ$

$= \sin(20^\circ - 50^\circ)$

$= \sin(-30^\circ)$

T $\tan 110^\circ = \dfrac{\tan 80^\circ + \tan 30^\circ}{1 - \tan 80^\circ \tan 30^\circ}$

$\tan(80^\circ + 30^\circ)$

F $\tan 60^\circ = \tan 100^\circ - \tan 40^\circ$

Evaluate. (Answer is a #)

$\sin \frac{5\pi}{4} \cos \frac{\pi}{2} - \cos \frac{5\pi}{4} \sin \frac{\pi}{2}$

$= \sin(A - B)$

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

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

$= \sin \frac{3\pi}{4}$

$= +\frac{\sqrt{2}}{2}$

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Find $\cos(A+B)$ given $\tan A = -\frac{\sqrt{5}}{2}$ ($\frac{y}{x}$) $\csc B = -\frac{3}{1}$ ($\frac{r}{y}$)

$\frac{\pi}{2} < A < \pi$ (II) and $\frac{3\pi}{2} < B < 2\pi$ (IV)

$$\cos(A+B) = \cos A \cos B - \sin A \sin B \quad (\tfrac{x}{r}, \tfrac{y}{r})$$

$$= \left(\frac{-2}{3}\right)\left(\frac{2\sqrt{2}}{3}\right) - \left(\frac{\sqrt{5}}{3}\right)\left(\frac{-1}{3}\right)$$

$$= -\frac{4\sqrt{2}}{9} + \frac{\sqrt{5}}{9}$$

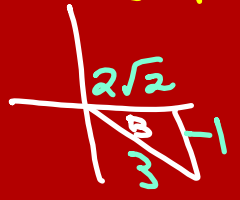
$$= \frac{-4\sqrt{2}+\sqrt{5}}{9}$$

$(\sqrt{5})^2 + (-2)^2 = r^2$

$5 + 4 = r^2$

$9 = r^2$

$3 = r$



$x^2 + 1 = 9$

$\sqrt{x^2} = \sqrt{8}$

$x = \pm 2\sqrt{2}$

Verify.

$$\frac{\sin(x+y)}{\cos x \cos y} = \tan x + \tan y$$

$$\frac{\sin x \cos y + \cos x \sin y}{\cos x \cos y} = \frac{\sin x \cos y}{\cos x \cos y} + \frac{\sin y \cos x}{\cos y \cos x}$$

$$= \frac{\sin x \cos y + \sin y \cos x}{\cos x \cos y}$$

Hint #63 $\cos\left(\frac{\pi}{2} + x\right) = -\sin x$

$$\cos\frac{\pi}{2}\cos x - \sin\frac{\pi}{2}\sin x = -\sin x$$

$$0 \cdot \cos x -$$