February 14, 2022

Sum + Difference Identities

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

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

$\cos(\overset{A}{30^\circ} + \overset{B}{60^\circ}) = \cos 30^\circ \cdot \cos 60^\circ - \sin 30^\circ \sin 60^\circ$

90°

$0 = \left(\frac{\sqrt{3}}{2}\right)\left(\frac{1}{2}\right) - \left(\frac{1}{2}\right)\left(\frac{\sqrt{3}}{2}\right)$

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

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

$\tan(A+B) = \dfrac{\tan A + \tan B}{1 - \tan A \tan B}$

$\tan(A-B) = \dfrac{\tan A - \tan B}{1 + \tan A \tan B}$

T or F

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

$\sin(A \oplus B) = \sin(20^\circ - 50^\circ)$

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

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

Evaluate. (Answer is a #)

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

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

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

$\sin\left(\frac{3\pi}{4}\right) = +\frac{\sqrt{2}}{2}$

All Star Trig Class!

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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)

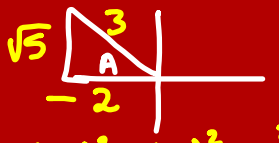
$\cos(A+B) = \cos A \cos B - \sin A \sin B$ ($\frac{x}{r}$, $\frac{y}{r}$)

BAD! $\cos\left(\frac{-2}{3}\right)\cos\left(\frac{2\sqrt{2}}{3}\right)$

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

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

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



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

$\sqrt{9} = \sqrt{r^2}$

$3 = r$

$x^2 + 1 = 9$

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

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

Verify.

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

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

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

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

$A + B$

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