TRIG REVIEW

$$\frac{\cos\frac{4\pi}{3} - \cot^2\left(\frac{-5\pi}{6}\right)}{\sin\frac{3\pi}{2}\sec\frac{15\pi}{4}}$$

$$\frac{-\frac{1}{2} - (\sqrt{3})^2}{(-1)(\sqrt{2})}$$

$$\frac{-\frac{1}{2} - 3}{-\sqrt{2}} = \frac{-\frac{1}{2} - \frac{6}{2}}{-\sqrt{2}} = \frac{+\frac{7}{2}}{+\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$$

$$= \frac{7\sqrt{2}}{2}$$

$$= \frac{7\sqrt{2}}{2} \cdot \frac{1}{2}$$

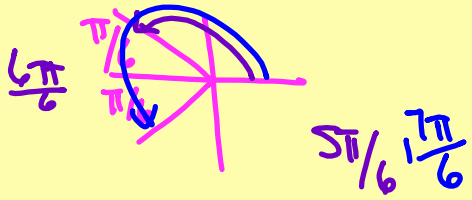
$$= \frac{7\sqrt{2}}{4}$$

	sin	cos	tan
0	0	1	0
$\pi/6$	$1/2$	$\sqrt{3}/2$	$\sqrt{3}/3$
$\pi/4$	$\sqrt{2}/2$	$\sqrt{2}/2$	1
$\pi/3$	$\sqrt{3}/2$	$1/2$	$\sqrt{3}$
$\pi/2$	1	0	Undef

$\sin\theta$ $\csc\theta$	All
$\tan\theta$ $\cot\theta$	$\cos\theta$ $\sec\theta$

Find all $0 \le \theta < 2\pi$

$\cos\theta = -\frac{\sqrt{3}}{2}$



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Find $\cot\theta$ given.

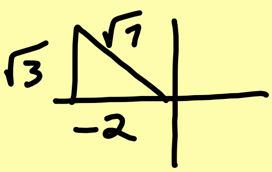
$\sec\theta = -\frac{\sqrt{7}}{2}$ $\frac{r}{x}$ & $\sin\theta > 0$.

$-$ (under 2) $+$ (under $\sin\theta$)

$\sin\theta = \frac{y}{r}$

$\cos\theta = \frac{x}{r}$

$\tan\theta = \frac{y}{x}$



$4 + y^2 = 7$

$\sqrt{y^2} = \pm\sqrt{3}$

$\cot\theta = \frac{x}{y}$

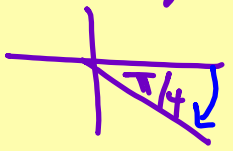
$= -\frac{2\cdot\sqrt{3}}{\sqrt{3}\cdot\sqrt{3}} = -\frac{2\sqrt{3}}{3}$

Inverse Trig Functions

$\cos^{-1}x$, $\sec^{-1}x$, $\cot^{-1}x$	All (+)
$\csc^{-1}x$, $\sin^{-1}x$, $\tan^{-1}x$	(−)

$\sin^{-1}x = \text{Arcsin } x$

$\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right) = \frac{-\pi}{4}$

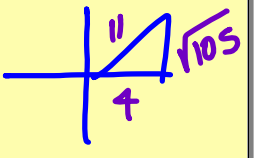


$y = \sin\theta$

$\theta = \sin^{-1}y$

$\csc\left(\sec^{-1}\frac{11}{4}\right)$ (r/x)

$\csc(\theta)$



$= \frac{r}{y} = \frac{11}{\sqrt{105}} = \frac{11\sqrt{105}}{105}$

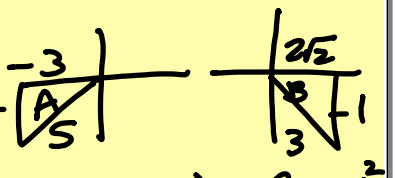
$16 + y^2 = 121$

$y^2 = 105$

$y = \pm\sqrt{105}$

If $\tan A = \frac{4}{3}\frac{y}{x}$ & $\csc B = -\frac{3}{1}\frac{r}{y}$ $\quad \pi < A < \frac{3\pi}{2}$ $\quad \frac{3\pi}{2} < B < 2\pi$

find $\cos(A-B)$.



$9-1=x^2$

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

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

$= \left(\frac{-3}{5}\right)\left(\frac{2\sqrt{2}}{3}\right) + \left(\frac{-4}{5}\right)\left(\frac{-1}{3}\right)$

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19 $\quad \dfrac{\sin\theta + \cos 2\theta - 1}{\cos\theta - \sin 2\theta} = \tan\theta$

$$\frac{\sin\theta + 1 - 2\sin^2\theta - 1}{\cos\theta - 2\sin\theta\cos\theta} = \frac{\sin\theta}{\cos\theta}$$

$$\frac{\sin\theta - 2\sin^2\theta}{\cos\theta - 2\sin\theta\cos\theta} =$$

$$\frac{\sin\theta(1 - 2\sin\theta)}{\cos\theta(1 - 2\sin\theta)}$$

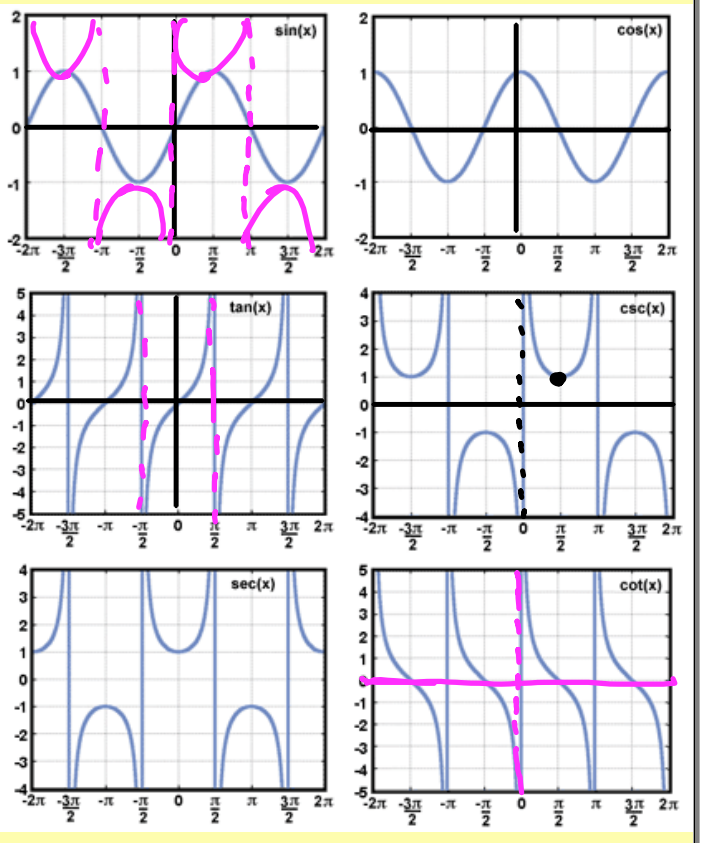
Spacing: period $\cdot \frac{1}{4}$

$2\pi \cdot \frac{1}{4} = \frac{\pi}{2}$

$y = (x+7)^2 + 4$

$y = a \sin(bx+c) + d$

	sin / cos	sec / csc	tan / cot
amp	$\lvert a \rvert$	NA	NA
period	$\frac{2\pi}{b}$	$\frac{2\pi}{b}$	$\frac{\pi}{b}$
phase shift	$bx+c=0$, $x=-c/b$		
vert. shift	d	d	d



Law of Sines

$$\frac{\sin A}{a} = \frac{\sin B}{b}$$

ASA, AAS, SSA*

Law of Cosines

$$a^2 = b^2 + c^2 - 2bc\cos A$$

SAS, SSS