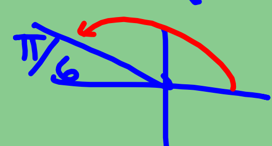
Inverse Trig Func + Trig Eq. Review

Inv. Trig Func. represent angles!
- always in rads
- 4th quadr. angles are written as negative angles.

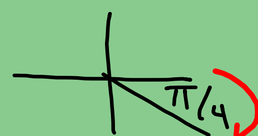
$-\left(\begin{array}{l}\cos^{-1}x\\ \sec^{-1}x\\ \cot^{-1}x\end{array}\right)$	All +
	$\left(\begin{array}{l}\csc^{-1}x\\ \sin^{-1}x\\ \tan^{-1}x\end{array}\right)-$

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



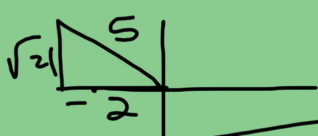
$\frac{5\pi}{6}$

$\text{Arccsc}\left(-\sqrt{2}\right) = -\frac{\pi}{4}$



$\tan\left(\underbrace{\sec^{-1} -\frac{5}{2}}\right)$ $\frac{r}{x}$

$\tan\ \theta$



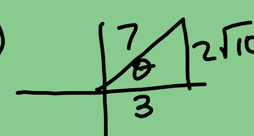
$y^2 + 4 = 25$

$\sqrt{y^2} = \pm\sqrt{21}$

$\boxed{\tan\theta = \frac{\sqrt{21}}{-2}}$

$\sin\left(2\,\underbrace{\text{Arccos}\,\frac{3}{7}}\right)$ $\frac{x}{r}$

$\sin(2\ \theta)$



$y^2 + 9 = 49$

$\sqrt{y^2} = \sqrt{40} \pm$
$= 2\sqrt{10}$

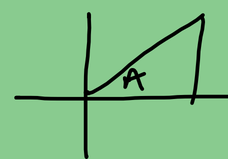
$\sin 2\theta = 2\sin\theta\cos\theta$

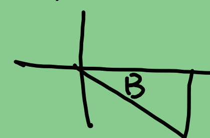
$= 2\left(\frac{2\sqrt{10}}{7}\right)\left(\frac{3}{7}\right)$

$= \frac{12\sqrt{10}}{49}$

$$\cos\Big(\underbrace{\sin^{-1}\tfrac{4}{3}}_{} - \underbrace{\tan^{-1}\left(-\tfrac{3}{5}\right)}_{}\Big)$$

$$\cos(\;A\; - \;B\;)$$

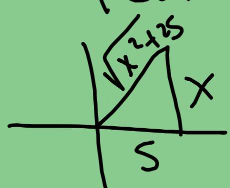




$$= \cos A \cos B + \sin A \sin B$$

Like 9-10

$$\csc\left(\cot^{-1}\frac{5}{x}\right)\frac{x}{y} = \csc\theta = \frac{r}{y} = \frac{\sqrt{x^2+25}}{x}$$



$$\sqrt{x^2+25} = \sqrt{r^2}$$

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Inv Trig Equations

1) Isolate trig func with variables
2) Switch positions using a inverse
3) Solve.

Solve

$$\cancel{\tfrac{7}{4}}\cdot\cancel{\tfrac{4}{7}}\ \text{Arccos}\left(\frac{2x}{3}\right) = \frac{3\pi}{\cancel{7}}\cdot\frac{\cancel{7}}{4}$$

$$\text{Arccos}\left(\frac{2x}{3}\right) = \frac{3\pi}{4}$$

Stop + Check quadrant

↑ Yes, $\frac{3\pi}{4}$ is QII

$\cos^{-1}x$ exists in

$$\cos\left(\frac{3\pi}{4}\right) = \frac{2x}{3}$$

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

$$-\frac{3\sqrt{2}}{4} = x.$$

$$\csc^{-1}(2x) + \cos^{-1}\left(\frac{1}{2}\right) = \frac{\pi}{6}$$

$$\csc^{-1}(2x) + \frac{\pi}{3} = \frac{\pi}{6}$$

$$\qquad -\frac{\pi}{3} \qquad -\frac{\pi}{3}$$

$$\csc^{-1}(2x) = -\frac{\pi}{6}$$ ⟸ Stop!

$$\csc\left(-\frac{\pi}{6}\right) = 2x$$

$$-\frac{2}{2} = \frac{2x}{2}$$

$$\boxed{-1 = x}$$