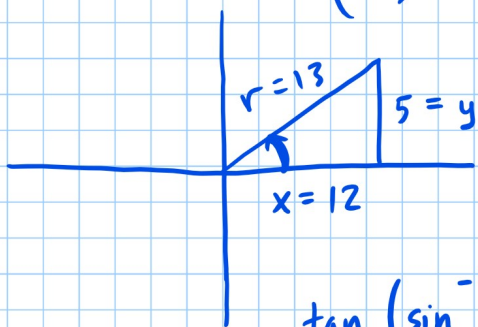


What does $\sin^{-1}\left(\frac{5}{13}\right)$ mean? angle between $-\frac{\pi}{2}$ and $\frac{\pi}{2}$ whose sine is $\frac{5}{13}$



$$\tan\left(\sin^{-1}\frac{5}{13}\right) = \frac{5}{12} \begin{matrix} \leftarrow y \\ \leftarrow x \end{matrix}$$

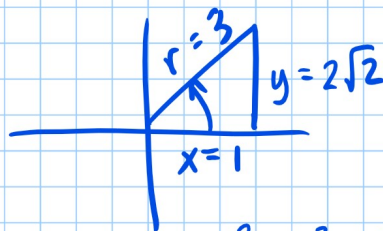
Section 6.2 Inverse Trig Functions Day 2

ex: $\cot\left[\underbrace{\sin^{-1}\left(-\frac{1}{2}\right)}_{\text{6.1 chart}}\right] = \cot\left(-\frac{\pi}{6}\right) = -\underbrace{\cot\frac{\pi}{6}}_{\text{chart}} = -\sqrt{3}$

$\sin(-\theta) = -\sin\theta$
 $\cos(-\theta) = \cos\theta$
 $\tan(-\theta) = -\tan\theta$
 $\csc(-\theta) = -\csc\theta$
 $\sec(-\theta) = \sec\theta$
 $\cot(-\theta) = -\cot\theta$

ex: $\csc\left(\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)\right) = \csc\left(\frac{5\pi}{6}\right) = 2$

ex: $\csc\left(\cos^{-1}\frac{1}{3}\right) = \frac{3}{2\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{3\sqrt{2}}{2 \cdot 2} = \frac{3\sqrt{2}}{4}$



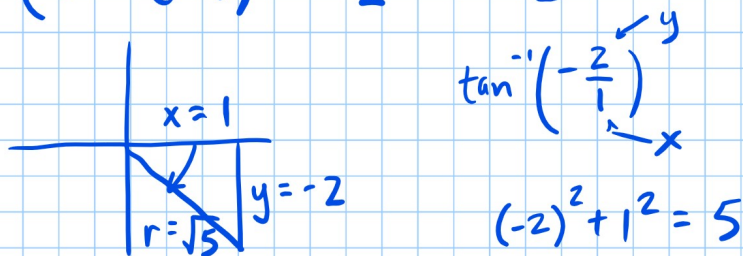
$$1^2 + y^2 = 3^2$$

$$y^2 = 8$$

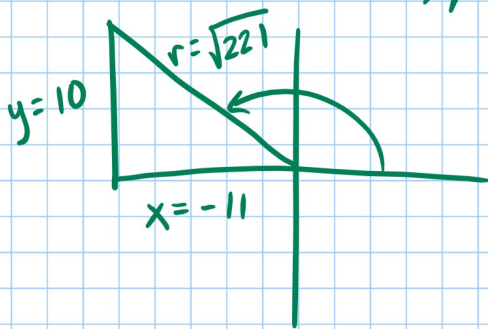
$$y = \sqrt{8} = 2\sqrt{2}$$

<u>Angle</u>	<u>If $R > 0$</u>	<u>If $R < 0$</u>
$\sin^{-1} R$	Q I	Q IV
$\cos^{-1} R$	Q I	Q II
$\tan^{-1} R$	Q I	Q IV
$\csc^{-1} R$	Q I	Q IV
$\sec^{-1} R$	Q I	Q II
$\cot^{-1} R$	Q I	Q II

ex: $\csc(\tan^{-1}(-2)) = \frac{\sqrt{5}}{-2} = -\frac{\sqrt{5}}{2}$



ex: $\sin(\cot^{-1}(-\frac{11}{10})) = \frac{10}{\sqrt{221}} \cdot \frac{\sqrt{221}}{\sqrt{221}} = \frac{10\sqrt{221}}{221}$



ex: Evaluate $\sec^{-1}(-\frac{5}{3})$ on a calculator
 $= \cos^{-1}(-\frac{3}{5}) \approx 2.21$ radians

$$\sec^{-1}\left(\frac{a}{b}\right) = \cos^{-1}\left(\frac{b}{a}\right)$$

$$\csc^{-1}\left(\frac{a}{b}\right) = \sin^{-1}\left(\frac{b}{a}\right)$$

$$\cot^{-1}\left(\frac{a}{b}\right) = \tan^{-1}\left(\frac{b}{a}\right)$$

6.2 Assignment

Find exact value of each:

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

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

3) $\sec\left(\tan^{-1}\sqrt{3}\right)$

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

5) $\cot\left(\tan^{-1}\frac{\sqrt{3}}{3}\right)$

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

7) $\tan\left(\sin^{-1}\frac{1}{3}\right)$

8) $\sec\left(\tan^{-1}\left(-\frac{12}{5}\right)\right)$

9) $\csc\left(\cos^{-1}\left(-\frac{7}{25}\right)\right)$

10) $\cot\left(\tan^{-1}\left(-\frac{40}{9}\right)\right)$

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S