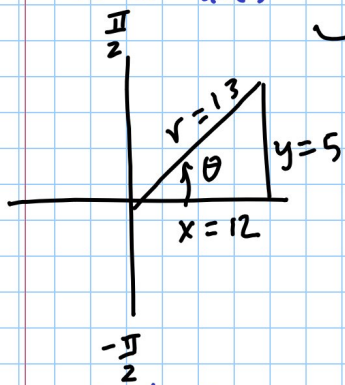
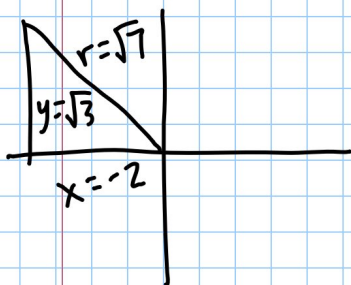


What does $\sin^{-1}\left(\frac{5}{13}\right)$ mean?



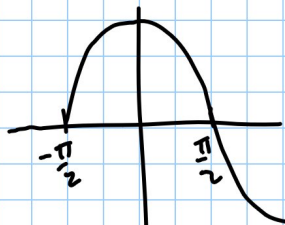
Angle between $-\frac{\pi}{2}$ and $\frac{\pi}{2}$ whose sine is $\frac{5}{13}$
 $\sin\theta = \frac{5}{13} = \frac{y}{r}$

What does $\cos^{-1}\left(-\frac{2}{\sqrt{7}}\right)$ mean?



Angle between 0 and π whose cosine is $-\frac{2}{\sqrt{7}} = \cos\theta$

$$\begin{aligned} (-2)^2 + y^2 &= \sqrt{7}^2 \\ 4 + y^2 &= 7 \\ y^2 &= 3 \end{aligned}$$



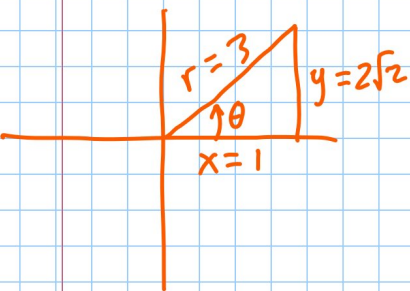
Section 6.2 Inverse Trig Functions Part 2

ex: $\cot\left[\underbrace{\sin^{-1}\left(-\frac{1}{2}\right)}_{\text{6.1 chart}}\right] = \cot\left(\underbrace{-\frac{\pi}{6}}_{\text{chart}}\right) = \cot\left(\frac{11\pi}{6}\right) = -\sqrt{3}$

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

ex: $\csc\left(\underbrace{\cos^{-1}\left(\frac{1}{3}\right)}_{\theta}\right)$ not in yesterday's chart
so we draw the Δ

$$\frac{3}{2\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{3\sqrt{2}}{2 \cdot 2} = \frac{3\sqrt{2}}{4}$$



$$\begin{aligned} 1^2 + y^2 &= 3^2 \\ y^2 &= 8 \\ y &= \sqrt{8} = 2\sqrt{2} \end{aligned}$$

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

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

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

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

Angle

If $R > 0$

If $R < 0$

$\sin^{-1} R$

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

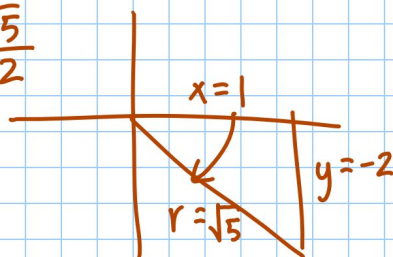
$\cot^{-1} R$

Q I

Q IV

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

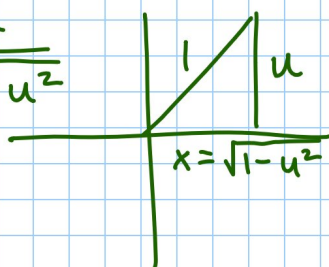
$$\frac{y}{x} = \frac{-2}{1}$$



$$1^2 + (-2)^2 = 5$$

ex: $\tan \left(\sin^{-1} u \right) = \frac{u}{\sqrt{1-u^2}}$

$$\frac{y}{r} = \frac{u}{1}$$



$$x^2 + u^2 = 1^2$$

$$x^2 = 1 - u^2$$

$$x = \sqrt{1 - u^2}$$

ex: $\sec^{-1} \left(-\frac{5}{3} \right) = \cos^{-1} \left(-\frac{3}{5} \right) = 2.21 \text{ radians}$

on calculator

6.2 Assignment

Find exact value of each:

C
H
A
R
T

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

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

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

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

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

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

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

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

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

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

11) $\sec(\tan^{-1} u)$