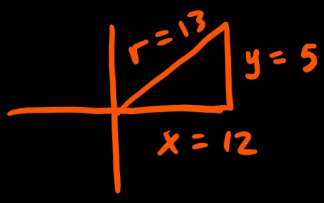
What does $\sin^{-1}\left(\frac{5}{13}\right)$ mean?

Angle between $-\frac{\pi}{2}$ and $\frac{\pi}{2}$ whose sine is $\frac{5}{13}$

↳ θ so that $\sin\theta = \frac{5}{13}$

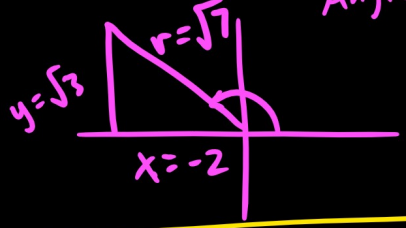


$$\tan\left(\sin^{-1}\frac{5}{13}\right) = \frac{5}{12}$$

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

x, r

Angle between 0 and π



Section 6.2 Inverse Trig Functions Part 2

ex: $\cot\left[\sin^{-1}\left(-\frac{1}{2}\right)\right] = \cot\left(-\frac{\pi}{6}\right) = -\cot\frac{\pi}{6}$

6.1 chart

$= -\sqrt{3}$

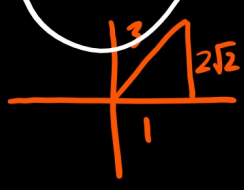
$\sin(-\theta) = -\sin\theta$
$\cos(-\theta) = \cos\theta$
$\tan(-\theta) = -\tan\theta$
$\csc(-\theta) = -\csc\theta$
$\sec(-\theta) = \sec\theta$
$\cot(-\theta) = -\cot\theta$

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

ex: $\csc\left(\cos^{-1}\frac{1}{3}\right)$

angle, x, r

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



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

$y^2 = 8$

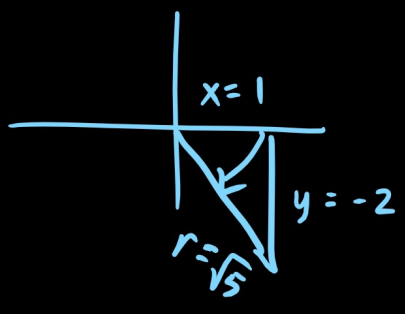
$y = \sqrt{8} = 2\sqrt{2}$

2, 2, 4 = 2

Angle	If $R > 0$	If $R < 0$
$\sin^{-1} R$	QI	QIV
$\cos^{-1} R$	QI	QII
$\tan^{-1} R$	QI	QIV
$\csc^{-1} R$	QI	QIV
$\sec^{-1} R$	QI	QII
$\cot^{-1} R$	QI	QII

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

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



Evaluate on calculator

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

calculator

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

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

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

6.2 Assignment

Find exact value of each:

CHART

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) $\cos\left(\tan^{-1}\frac{2}{\sqrt{3}}\right) = \frac{\sqrt{21}}{7}$

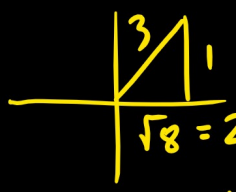
7) $\tan\left(\sin^{-1}\frac{1}{3}\right) = \frac{\sqrt{2}}{4}$

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

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

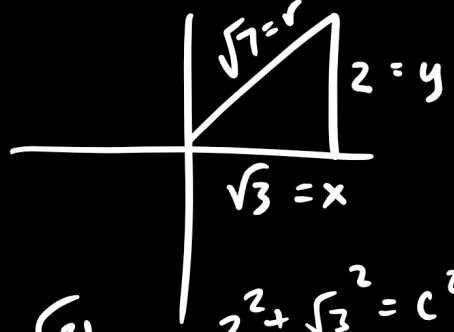
10) $\cot\left(\tan^{-1}\left(-\frac{40}{9}\right)\right)$

7)



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

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



$2^2 + \sqrt{3}^2 = c^2$

$7 = c^2$

$\frac{\sqrt{3}}{\sqrt{7}} \frac{\sqrt{7}}{\sqrt{7}} = \frac{\sqrt{21}}{7}$