$\simeq$ isomorphic

$\approx$ approx.

$\sin(a+b) = \sin a\cos b + \sin b\cos a$

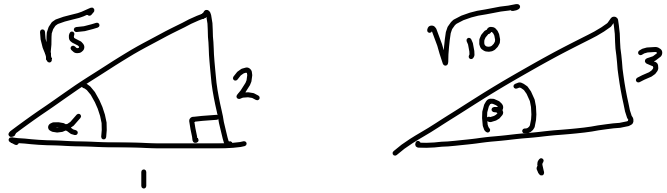
$\cos(a+b) = \cos a\cos b - \sin a\sin b$

SC.6 #10

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

$= \cos(\tan^{-1}(2))\cos(\tan^{-1}(3)) - \sin(\tan^{-1}(2))\sin(\tan^{-1}(3))$

$= \cos\alpha\cos\beta - \sin\alpha\sin\beta$

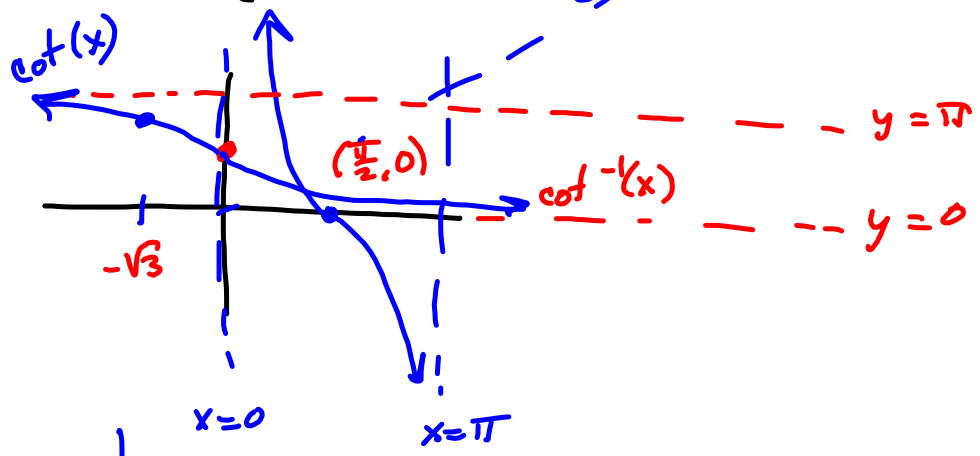


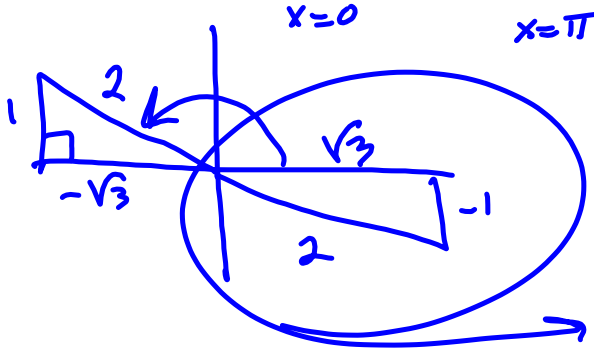
$= \frac{1}{\sqrt{5}}\cdot\frac{1}{\sqrt{10}} - \frac{2}{\sqrt{5}}\cdot\frac{3}{10}$

$= \frac{1-6}{\sqrt{50}} = \frac{-5}{5\sqrt{2}} = -\frac{1}{\sqrt{2}} = -\frac{\sqrt{2}}{2}$ is fine.

I wouldn't worry about an irrational denominator, generally speaking. If "simplified radical form" is *specified*, THEN worry about it. Otherwise, you've got better stuff to spend your time on.

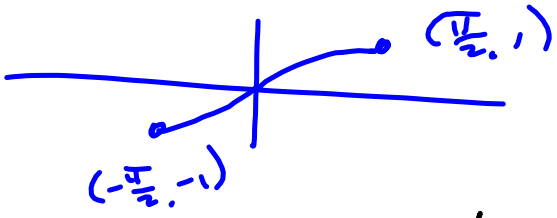
6.6 #4 $\cot^{-1}(-\sqrt{3}) = \frac{5\pi}{6}$





The other Δ with $\cot\theta = -\sqrt{3}$

restricted sine $\sin^{-1}(1) = \arcsin(1) = \frac{\pi}{2}$



Ambiguous Notation SUCKS!

$\sin^{-1}(x) = \begin{cases} \frac{1}{\sin(x)} = \csc(x) \; ? \\ \arcsin(x) \; ? \end{cases}$

Inverse wrt multiplication

Inverse wrt function composition

$\sin^{-1}(x)$

$\arcsin(\sin(x)) = x$ if $x \in [-\frac{\pi}{2}, \pi/2]$

$\sin^{-1}(\sin(x))$ might not mean the same thing, depending on how we're (ab)using the notation.

$\sin^2(x) = (\sin(x))^2$

$\sin^{-2}(x) = \frac{1}{\sin^2 x} = \csc^2 x$

$\sin^{-1}(x) = \frac{1}{\sin(x)} = \csc(x)$.

Sometimes.

Sometimes not

Depends on context

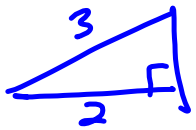
I prefer CLARITY.

Calculator:

$\sin^{-1}(x) = \arcsin(x)$

To do $\csc(x)$, you have to do $1/\sin(x)$

$\operatorname{arcsec}(\frac{3}{2})$ on calculator



$= \arccos(\frac{2}{3})$

Should Know

$\sin x \qquad \csc x = \frac{1}{\sin x}$

$\cos x \qquad \sec x = \frac{1}{\cos x}$

$\tan x = \frac{\sin x}{\cos x}$ / $\cot x = \frac{1}{\tan x} = \frac{\cos x}{\sin x}$

$\sin^2 x + \cos^2 x = 1$

$\tan^2\theta + 1 = \sec^2\theta$

$\cot^2\theta + 1 = \csc^2\theta$