4b) $$\frac{\sec\alpha \sec\beta}{1+\tan\alpha\tan\beta} = \frac{\left(\frac{1}{\cos\alpha}\cdot\frac{1}{\cos\beta}\right)\cos\alpha\cdot\cos\beta}{\left(1+\frac{\sin\alpha}{\cos\alpha}\cdot\frac{\sin\beta}{\cos\beta}\right)\cos\alpha\cdot\cos\beta}$$

$$= \frac{1}{\cos\alpha\cos\beta+\sin\alpha\sin\beta}$$

$$\frac{\left(1+\frac{1}{4}\right)36}{\frac{2}{9}\cdot 36}$$

$$= \frac{1}{\cos(\alpha-\beta)} = \sec(\alpha-\beta)$$

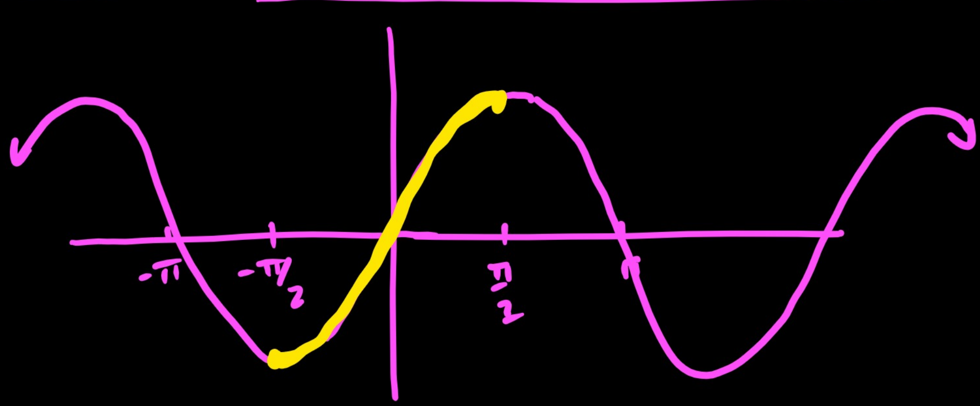
3a) $$\tan 165^\circ = \tan\frac{330^\circ}{2} = \frac{1-\cos 330^\circ}{\sin 330^\circ} = \frac{\left(1-\frac{\sqrt{3}}{2}\right)(-2)}{\left(-\frac{1}{2}\right)(-2)}$$

$$\cancel{2}\cdot\frac{\theta}{\cancel{2}} = 165^\circ\cdot 2$$

$$\theta = 330^\circ$$

$$= \frac{-2+\sqrt{3}}{1} = -2+\sqrt{3}$$

Section 6.1 Inverse Sine, Cosine, and Tangent



Inverse Sine

$\sin^{-1}x$ ($\arcsin x$) is asking for angle between $-\frac{\pi}{2}$ and $\frac{\pi}{2}$ whose sine is x

$$\sin^{-1}\frac{\sqrt{2}}{2}=\frac{\pi}{4}$$

Inverse Cosine

$\cos^{-1}x$ ($\arccos x$) is asking for angle between 0 and π whose cosine is x

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

Inverse Tangent

$\tan^{-1}x$ ($\arctan x$) is asking for angle between $-\frac{\pi}{2}$ and $\frac{\pi}{2}$ whose tangent is x

$$\tan^{-1}(-\sqrt{3})=-\frac{\pi}{3}$$

sine	cosine	tangent
$\sin^{-1}(-1)=-\frac{\pi}{2}$	$\cos^{-1}(-1)=\pi$	$\tan^{-1}(-\sqrt{3})=-\frac{\pi}{3}$
$\sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)=-\frac{\pi}{3}$	$\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)=\frac{5\pi}{6}$	$\tan^{-1}(-1)=-\frac{\pi}{4}$
$\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)=-\frac{\pi}{4}$	$\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)=\frac{3\pi}{4}$	$\tan^{-1}\left(-\frac{\sqrt{3}}{3}\right)=-\frac{\pi}{6}$
$\sin^{-1}\left(-\frac{1}{2}\right)=-\frac{\pi}{6}$	$\cos^{-1}\left(-\frac{1}{2}\right)=\frac{2\pi}{3}$	$\tan^{-1}0=0$
$\sin^{-1}0=0$	$\cos^{-1}0=\frac{\pi}{2}$	$\tan^{-1}\frac{\sqrt{3}}{3}=\frac{\pi}{6}$
$\sin^{-1}\frac{1}{2}=\frac{\pi}{6}$	$\cos^{-1}\frac{1}{2}=\frac{\pi}{3}$	$\tan^{-1}1=\frac{\pi}{4}$
$\sin^{-1}\frac{\sqrt{2}}{2}=\frac{\pi}{4}$	$\cos^{-1}\frac{\sqrt{2}}{2}=\frac{\pi}{4}$	$\tan^{-1}\sqrt{3}=\frac{\pi}{3}$
$\sin^{-1}\frac{\sqrt{3}}{2}=\frac{\pi}{3}$	$\cos^{-1}\frac{\sqrt{3}}{2}=\frac{\pi}{6}$	
$\sin^{-1}1=\frac{\pi}{2}$	$\cos^{-1}1=0$	

ex: $$\cos\Big(\underbrace{\cos^{-1}\frac{\sqrt{2}}{2}}_{\text{today's chart}}\Big)=\underbrace{\cos\frac{\pi}{4}}_{\text{Ch 5 chart}}=\frac{\sqrt{2}}{2}$$

ex: $\sin\left(\sin^{-1}\frac{14}{15}\right) = \frac{14}{15}$

as long as sin, cos, or tan are on outside of $\sin^{-1}$, $\cos^{-1}$, or $\tan^{-1}$ the functions cancel.*

* For sin and cos, the number has to be between -1 and 1, inclusive, or else it's undefined.

When inverse is on the outside evaluate the inside first.

$$\cos^{-1}\left(\cos\frac{11\pi}{6}\right) = \cos^{-1}\frac{\sqrt{3}}{2} = \frac{\pi}{6}$$

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

p468 1-35 odd

For calculator problems, put your calculator in radian mode.

31) $\sin^{-1}\left[\sin\left(\underbrace{-\frac{3\pi}{7}}\right)\right] = -\frac{3\pi}{7}$

27) $\cos^{-1}\left[\cos\left(\frac{4\pi}{5}\right)\right] = \frac{4\pi}{5}$