

4.7 Inverse Trig Functions

$\sin x = \frac{1}{2}$

What angle has a y-value of 1/2?

$x = \frac{\pi}{6}$

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When you have a negative:

Negative cosine use Q1 and Q2

$\cos \theta$ Domain $[-\pi, \pi]$

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

Negative sin and tan use Q1 and Q4 answer will be a negative angle

$\sin \theta$ $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

$\tan \theta$ $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

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$\sin^{-1}(-\sqrt{3}/2)$

$-\sin$ is -angle in Q4

$\frac{\pi}{3}$ reference angle

$\left(-\frac{\pi}{3}\right)$

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The angle will be negative
if the sin or tan is negative

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$\tan x = \sqrt{3}$ Q1

What angle has a tan of $\sqrt{3}$? Tan is y/x .

$x = \frac{\pi}{3}$

$\tan 30^\circ = \frac{\sqrt{3}}{3}$

$\tan 60^\circ = \sqrt{3}$

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Another way to write $\sin x = 1/2$ is to use the inverse notation.

$\sin^{-1} \frac{\sqrt{3}}{2}$ $\frac{\pi}{3}$

Basically what angle has a y-value of $\sqrt{3}/2$

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Another notation is to use the arc

$\arccos(-1)$ $\cos^{-1}(-1)$ $\cos x = -1$

What angle has an x-value of -1?

π

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$\cos^{-1}(.351)$

Make sure you are in degree mode.

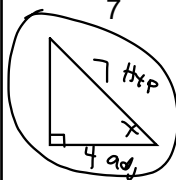
2nd cos .351 69.45°

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Use the inverse to solve for an angle.

$\cos x = \frac{4}{7}$ Draw a triangle, label the opposite, adjacent, and hypotenuse sides.

$\cos^{-1} \frac{4}{7}$ x = angle



$x = 55.15^\circ$

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$\sin^{-1}(\sin \frac{\pi}{9})$ $\sin^{-1} .29$ $\frac{\pi}{9}$

$\frac{\pi}{9}$

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$\sin^{-1}(\sin \frac{5\pi}{4})$ Sin is neg use Q4


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

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$\sin^{-1} \sin(3.49\pi)$ Use technology to enter in Calc.
 -1.539

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$\sin(\tan^{-1} x)$ Draw a triangle



$\sin \frac{\theta}{H} = \frac{X}{\sqrt{1+X^2}}$

$1^2 + X^2 = H^2$
 $\sqrt{1+X^2} = \sqrt{H^2}$
 $\sqrt{1+X^2} = H$

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Pg. 421-422
 #1-20, 23-32, 48, 49, 50, 52
 triangle

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① $\frac{\pi}{3}$ ② $-\frac{\pi}{6}$
 ③ 0 ④ 0
 ⑤ $\frac{\pi}{3}$ ⑥ $\frac{\pi}{4}$
 ⑦ $-\frac{\pi}{4}$

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②③ $\cos(\sin^{-1} \frac{1}{2})$
 $\cos 30$
 $\frac{\sqrt{3}}{2}$

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$\sin^{-1}(-.81)$
 Radian Mode -.94

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