5.5 Solving Right Triangles

LT29: I can derive the Unit Circle and find trigonometric values when given angles in degrees, and vice versa.

Review

Ex. $\tan 45°$ y/x

$\tan \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$

$\cos 315° = \frac{\sqrt{2}}{2}$ x

Given the trig. ratio, find the angle.

-We use the inverse function. We call this the arcsine relation

Ex. $\sin x = \frac{\sqrt{2}}{2}$ can be written as $x = \arcsin(\frac{\sqrt{2}}{2})$

$\cos x = 1$ can be written as $x = \arccos(1)$

We can also write this as $\sin^{-1}(y) = x$

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

Ex $\tan x = 1$

$\tan^{-1}(1) = x$

$45°, 225°, \ldots$

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

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

$210°, 330°$

Ex $\tan(\tan^{-1}\frac{4}{5}) = \frac{4}{5}$

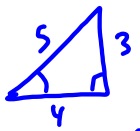
Ex $\tan(\cos^{-1}\frac{4}{5})$

Let $\cos^{-1}\frac{4}{5} = B$

$\cos B = \frac{4}{5}$ Defn. of inverse

$\tan B = \frac{3}{4}$

$\therefore \tan(\cos^{-1}\frac{4}{5}) = \frac{3}{4}$



$4^2 + b^2 = 5^2$

$-16 \quad -16$

$b^2 = 9$

Ex $\sin(\arccos\frac{2}{5})$

Let $B = \arccos\frac{2}{5}$

$\cos B = \frac{2}{5}$ ← Defn. of inverse

$\sin B = \frac{\sqrt{21}}{5}$

$\therefore \sin(\arccos\frac{2}{5}) = \frac{\sqrt{21}}{5}$

$2^2 + b^2 = 5^2$

$-4 \quad -4$

$\sqrt{b^2} = \sqrt{21}$