

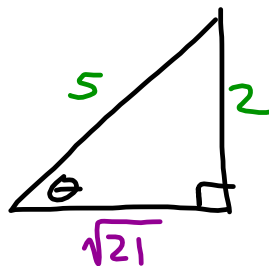
13A

$$\cos(\csc^{-1}(\frac{5}{2})) =$$

$$\csc^{-1}(\frac{5}{2}) = \theta$$

$$\csc \theta = \frac{5}{2}$$

$\frac{1}{\sin}$



$$\begin{aligned} \cos \theta &= \frac{\sqrt{21}}{5} = \frac{\sqrt{21}}{\sqrt{25}} \\ &= \sqrt{\frac{21}{25}} \end{aligned}$$

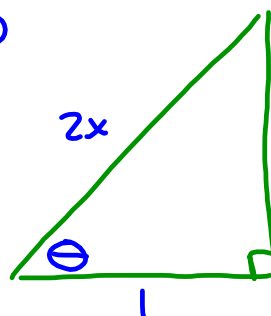
13C

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

$$\sec^{-1}(2x) = \theta$$

$$\sec \theta = 2x$$

$\frac{1}{\cos}$



$$\begin{aligned} 1^2 + b^2 &= (2x)^2 \\ 1 + b^2 &= 4x^2 \\ b^2 &= 4x^2 - 1 \\ b &= \sqrt{4x^2 - 1} \end{aligned}$$

$$\sin \theta = \frac{\sqrt{4x^2 - 1}}{\sqrt{(2x)^2}}$$

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

14A

$\sin^{-1}\left(\sin\left(\frac{5\pi}{4}\right)\right)$
 $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right) = -\frac{\pi}{4}$

$\frac{5\pi}{4}$ becomes $-\frac{\pi}{4}$ because $\frac{5\pi}{4}$ is not in the range of \sin^{-1}
 $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

14

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

The solution changes Quadrants to be in the range of \sin^{-1} and changes $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ Values because we went from $\cos \rightarrow \sin$.

$\sin 60 = \frac{\sqrt{3}}{2}$
 $\cos 30 = \frac{\sqrt{3}}{2}$

5
A

$$f(x) = 3 \sin^{-1}(4x-1) + 2$$

sin⁻¹ Domain: $[-1, 1]$ $-1 \leq x \leq 1$

$$\left[0, \frac{1}{2}\right]$$

$$-1 \leq 4x-1 \leq 1$$

$$\begin{matrix} +1 & & +1 & +1 \end{matrix}$$

$$\frac{0}{4} \leq \frac{4x}{4} \leq \frac{2}{4}$$

Range: $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

$$0 \leq x \leq \frac{1}{2}$$

$$\left[2 - \frac{3\pi}{2}, 2 + \frac{3\pi}{2}\right] \quad 3\left(-\frac{\pi}{2}\right) + 2 \leq y \leq 3\left(\frac{\pi}{2}\right) + 2$$

$$2 - \frac{3\pi}{2} \leq y \leq 2 + \frac{3\pi}{2}$$

6
I

$$n_1 \sin \theta_1 = n_2 \sin \theta_2$$

a) $\frac{1.33 \sin 40^\circ}{1.52} = \frac{1.52 \sin \theta_2}{1.52}$

$n_1 = 1.33$
 $n_2 = 1.52$
 $\theta_1 = 40^\circ$

$$\sin^{-1}\left(\frac{1.33 \sin 40^\circ}{1.52}\right) = \theta_2 = 34.22^\circ$$

b) $\frac{1.33 \sin 90^\circ}{1.52} = \frac{1.52 \sin \theta_2}{1.52}$

$$\sin^{-1}\left(\frac{1.33 \sin 90^\circ}{1.52}\right) = \theta_2 = 61.04^\circ$$

\tan^{-1}
 \sin^{-1}

✓
✓

\cos^{-1}

✓
✓