

Practice 7.8: Inverse Trig Functions

1. Evaluate the following expressions without using a calculator.

*Can be answered in degrees or radians
cos θ ≠ 2 ever*

- a. $\arcsin \frac{1}{2} = 30^\circ$ b. $\sin^{-1} \frac{1}{2} = 30^\circ$ c. $\arccos \frac{1}{2}$ d. $\cos^{-1}(2) = \text{undefined}$
same
- e. $\tan^{-1}(1) = 45^\circ$ f. $\arctan\left(\frac{\sqrt{3}}{3}\right)$ g. $\arccos\left(-\frac{\sqrt{2}}{2}\right)$ h. $\sin^{-1}\left(-\frac{\sqrt{3}}{2}\right) = -60^\circ$
= -450

2. Use a calculator to evaluate the following expressions.

- a. $\arcsin(0.906)$ b. $\sin^{-1}(0.906)$ c. $\arccos(0.966)$ d. $\cos^{-1}(0.819)$
same
~ 65° *~ 65°* *~ 15°*
- e. $\tan^{-1}(1.19)$ f. $\arctan(0.364)$ g. $\arccos(0.342)$ h. $\sin^{-1}(1.0001) = \text{und}$
~ 50° *~ 70°* *sin θ ≤ 1*

3. Evaluate the expressions.

- a. $\sin(\arcsin \frac{1}{2}) = \frac{1}{2}$ b. $\cos^{-1}(\cos(330^\circ))$
- c. $\tan^{-1}(\tan(\frac{7\pi}{4})) = -\frac{\pi}{4}$ or -45° d. $\sin(\sin^{-1}(-\frac{\sqrt{2}}{2}))$

4. Find the exact value of the expression without using a calculator by sketching the appropriate right triangle.

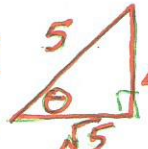
a. $\sin(\arctan \frac{3}{4})$

b. $\sin(\cos^{-1} \frac{\sqrt{5}}{5})$

Sine θ = $\frac{2\sqrt{5}}{5}$
SOH
solve for missing side
(5² - √5² = 20)
← √20 or 2√5

cos⁻¹ $\frac{\sqrt{5}}{5}$ = θ
⇒ cos θ = $\frac{\sqrt{5}}{5}$

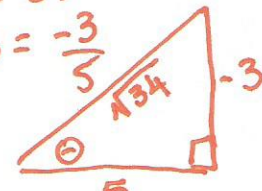
forms this Δ



c. $\cos(\sin^{-1}(-\frac{5}{13}))$

d. $\sec(\arctan(-\frac{3}{5}))$ *sec(θ) = $\frac{\sqrt{34}}{5}$*

tan⁻¹ $(-\frac{3}{5})$ = θ
tan θ = $-\frac{3}{5}$



(-3)² + 5² = 34