

§ 4.7 p. 421 (8, 10, 15, 28, 31, 32, 33, 44, 45, 48, 49, 50, 55, 57, 58, 66(a, b), 68) *Kayla*
 (Precal) Period $\sqrt{-1}$

8 $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right) = \frac{5\pi}{6}$ 10 $\tan^{-1}(-\sqrt{3}) = \frac{-\pi}{3}$ 15 $\tan^{-1}(-12.5) \approx \boxed{-85.426^\circ}$

28 $\sin(\tan^{-1}(-1)) = \sin\left(-\frac{\pi}{4}\right) = \boxed{\frac{-\sqrt{2}}{2}}$
 31 $\cos(\tan^{-1}\sqrt{3}) = \cos\left(\frac{\pi}{3}\right) = \boxed{\frac{1}{2}}$
 32 $\tan^{-1}(\cos\pi) = \tan^{-1}(-1) = \boxed{\frac{-\pi}{4}}$

33 $f(x) = \sin^{-1}x$

D: $[-1, 1]$
 R: $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$
 Continuous on $[-1, 1]$
 Monotonic increasing
 origin symmetry (odd)
 Bounded above & below
 No Extrema
 No Asymptotes
 No End Behavior

44 $\tan^{-1}x = -1$
 $x = \tan(-1)$ radian angle
 (-1 is Not a unit circle angle, so use calculator)
 $x = \boxed{-1.557}$

45 $\cos(\cos^{-1}x) = \frac{1}{3}$
 $\cos^{-1}x = \cos^{-1}\left(\frac{1}{3}\right)$
 $x = \boxed{\frac{1}{3}}$

46 $\cos(\tan^{-1}x)$
 $\theta = \tan^{-1}x = \tan^{-1}\left(\frac{x}{1}\right)$ ← vert
← horz

$\cos\theta = \frac{1}{\sqrt{x^2+1}} = \frac{\sqrt{x^2+1}}{x^2+1}$

49 $\tan(\arcsin x)$
 $\theta = \arcsin x = \arcsin\left(\frac{x}{1}\right)$ ← vert
← hyp.

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

50 $\cot(\arccos x)$
 $\theta = \arccos x = \arccos\left(\frac{x}{1}\right)$ ← horz
← hyp

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

55

a) $\tan\theta = \frac{S}{500}$
 $\theta = \tan^{-1}\left(\frac{S}{500}\right)$

b) $\Delta\theta(10-20) = \tan^{-1}\left(\frac{20}{500}\right) - \tan^{-1}\left(\frac{10}{500}\right) = 1.145^\circ$
 $\Delta\theta(200-210) = \tan^{-1}\left(\frac{210}{500}\right) - \tan^{-1}\left(\frac{200}{500}\right) = 0.981^\circ$
 so Angle changes More at lower elevations.

c) the x-axis represents the balloon height, y-axis is the angle, which increases at a decreasing rate, approaching 90° . Look at scales too!

Precal MW §4.7 cont

57 T or F:

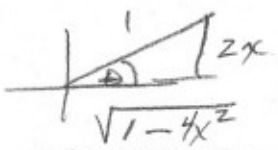
$\sin(\sin^{-1}x) = x$, for all x ? True, however $\sin^{-1}(\sin x) \neq x$ unless $x \in \text{Range of } \sin^{-1}$.

58 T or F:

$y = \arctan x$ has 2 HAs? True, e.g. $y = \pm \frac{\pi}{2}$

66a $\cos(\sin^{-1} 2x)$

$\theta = \sin^{-1}(2x) = \sin^{-1}\left(\frac{2x}{1}\right)$
vert hyp



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

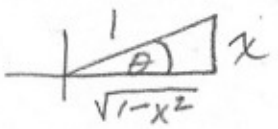
66b $\sec^2(\tan^{-1} x)$

$\theta = \tan^{-1} x = \tan\left(\frac{x}{1}\right)$
vert horiz



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

68 a) $\frac{\sqrt{1-x^2}}{1} = y$

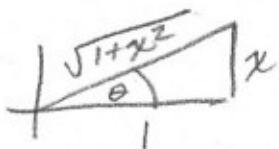


$\theta = \sin^{-1} x$

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

(there are other answers)

b) $y = \frac{x}{\sqrt{1+x^2}}$



$\theta = \tan^{-1} x$

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

(there are other possibilities)

c) $y = \frac{x}{\sqrt{1-x^2}}$



$\theta = \cos^{-1} x$

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

(other possibilities)

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 - done
 - Keyz