

Inverse Trig Functions, cont.

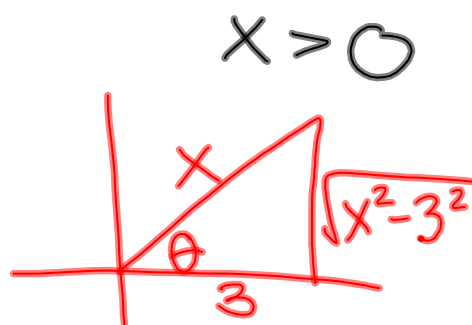
$$1. \cos(\underbrace{\sin^{-1} \frac{\sqrt{3}}{2}}_{\theta}) = \cos \frac{\pi}{3} = \boxed{\frac{1}{2}}$$

$$2. \sin^{-1} \left[\tan \left(\frac{-\pi}{4} \right) \right] = \sin^{-1}(-1) = \boxed{-\frac{\pi}{2}}$$

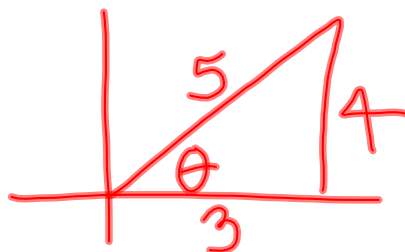
~~θ~~
 $(0, -1)$

$$3. \tan(\underbrace{\cos^{-1} \frac{3}{x}}_{\theta})$$

$$= \boxed{\frac{\sqrt{x^2 - 9}}{3}}$$



$$4. \sin(2 \underbrace{\cos^{-1} \frac{3}{5}}_{\theta})$$



$$= 2 \sin \theta \cos \theta$$

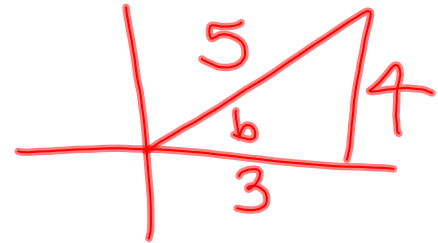
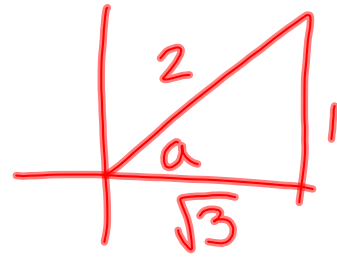
$$= 2 \cdot \frac{4}{5} \cdot \frac{3}{5} = \boxed{\frac{24}{25}}$$

$$5. \sin(\underbrace{\sin^{-1} \frac{1}{2}}_a + \underbrace{\cos^{-1} \frac{3}{5}}_b)$$

$$= \sin a \cos b + \cos a \sin b$$

$$= \frac{1}{2} \cdot \frac{3}{5} + \frac{\sqrt{3}}{2} \cdot \frac{4}{5}$$

$$= \boxed{\frac{3 + 4\sqrt{3}}{10}}$$



$$6. \cos(\underbrace{\sin^{-1} x}_a - \underbrace{\cos^{-1} y}_b)$$

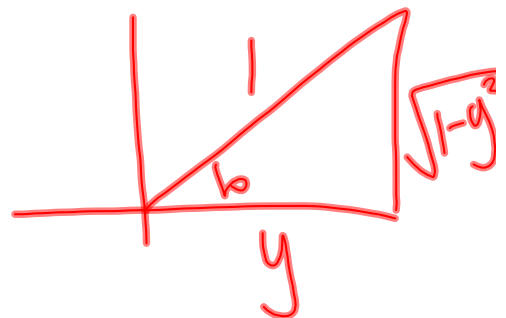
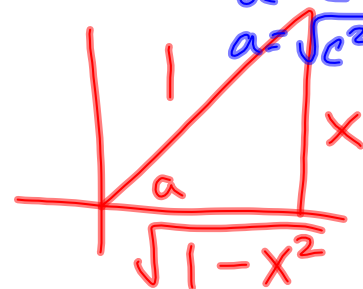
$$= \cos a \cos b + \sin a \sin b$$

$$= (\sqrt{1-x^2})(y) + x\sqrt{1-y^2}$$

$$= \boxed{y\sqrt{1-x^2} + x\sqrt{1-y^2}}$$

$x, y > 0$

$$\begin{aligned} a^2 + b^2 &= c^2 \\ a^2 &= c^2 - b^2 \\ a &= \sqrt{c^2 - b^2} \end{aligned}$$



textbook

39. $\cos^{-1}(\cos(\frac{-\pi}{4}))$

47. $\tan(\cos^{-1}(\frac{\sqrt{2}}{2}))$ ↙ $\frac{1}{\sqrt{2}}$

41. $\sin^{-1}(\sin \frac{\pi}{5})$

53. $\sin^{-1}(\sin \frac{7\pi}{6})$

43. $\tan^{-1}(\tan \frac{2\pi}{3})$

55. $\sin(\tan^{-1} \frac{a}{3})$

45. $\sin(\tan^{-1}(\frac{\sqrt{3}}{3}))$ ↙ $\frac{1}{\sqrt{3}}$

63. $\cos(\sin^{-1} \frac{\sqrt{2}}{2} + \cos^{-1} \frac{3}{5})$
HW: 25-53
6 handout