

6.3 handout

$$q3. \quad \cos \frac{x}{5} = 1 - 2 \sin^2 \frac{x}{10}$$

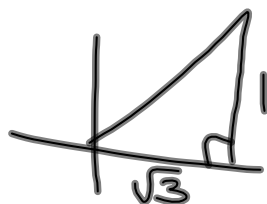
$$\text{LHS} = \cos 2\left(\frac{x}{10}\right) = 1 - 2 \sin^2 \frac{x}{10} = \text{RHS}$$

$$69. \quad \sin^3 x + \cos^3 x = (\sin x + \cos x) \left(1 - \frac{1}{2} \sin 2x\right)$$

$$\begin{aligned} \text{LHS} &= (\sin x + \cos x) (\sin^2 x - \sin x \cos x + \cos^2 x) \\ &= (\sin x + \cos x) (1 - \sin x \cos x) \\ &= (\sin x + \cos x) \left(1 - \frac{1}{2} (2 \sin x \cos x)\right) = \text{RHS} \checkmark \end{aligned}$$

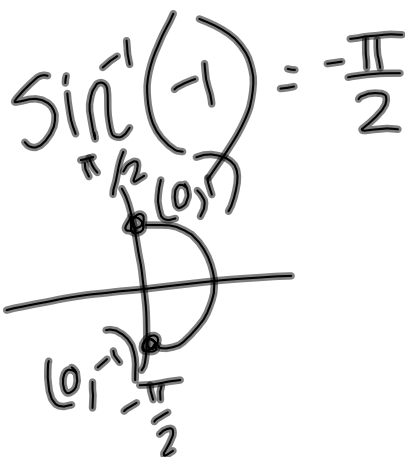
$$\tan^{-1}\left(\frac{1}{\sqrt{3}}\right) = \frac{\pi}{6}$$

$-\frac{\pi}{2}, \frac{\pi}{2}$



$$\sec^{-1}(-\sqrt{2}) = \frac{3\pi}{4}$$

$0, \pi$

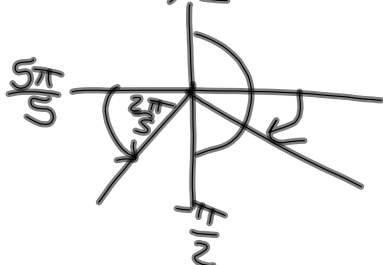


$$\csc^{-1}\left(\csc^{-\frac{\pi}{8}}\right) = -\frac{\pi}{8}$$

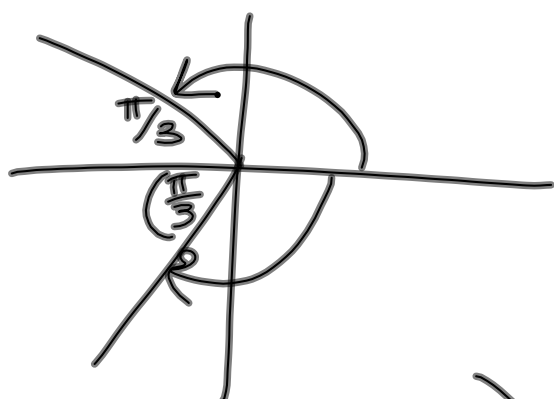
$$\cot^{-1}\left(\cot \frac{22\pi}{23}\right) = \frac{22\pi}{23}$$

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

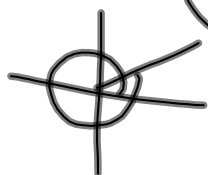
$$\sin^{-1}\left(\sin \frac{7\pi}{5}\right) = -\frac{2\pi}{5}$$



$$\cos^{-1}\left(\cos^{-\frac{2\pi}{3}}\right) = \boxed{\frac{2\pi}{3}}$$



$$\csc^{-1}\left(\csc \frac{13\pi}{6}\right) = \frac{\pi}{6}$$



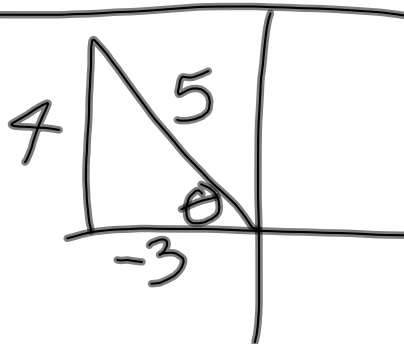
6.4 book

$$46. \cos\left(\sin^{-1}\frac{\sqrt{3}}{2}\right)$$

$$= \cos\left(\frac{\pi}{3}\right) = \boxed{\frac{1}{2}}$$

$$\tan\left(\sec^{-1}\frac{5}{3}\right)$$

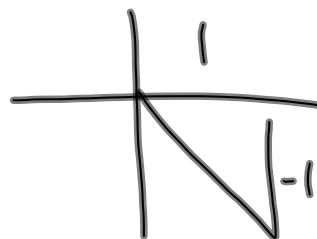
$$= \boxed{-\frac{4}{3}}$$



$$50. \sin^{-1}\left[\tan\left(-\frac{\pi}{4}\right)\right]$$

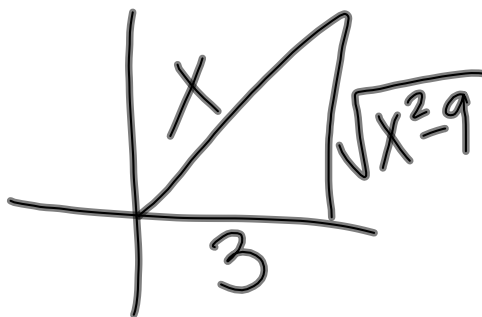
$$= \sin^{-1}(-1)$$

$$= \boxed{-\frac{\pi}{2}}$$



$$56. \tan(\underbrace{\cos^{-1} \frac{3}{x}}_{\theta})$$

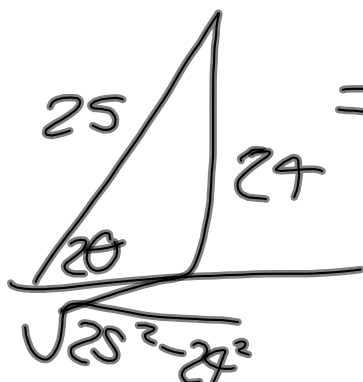
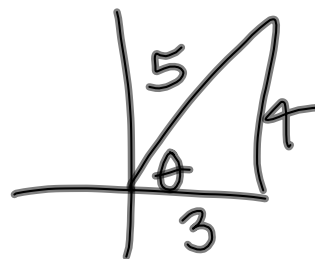
$$= \frac{\sqrt{x^2 - 9}}{3}$$



$$62. \sin(2 \underbrace{\cos^{-1} \frac{3}{5}}_{\theta})$$

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

$$= 2 \left(\frac{4}{5} \right) \left(\frac{3}{5} \right)$$

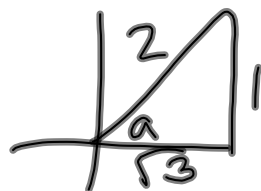


$$= \frac{24}{25}$$

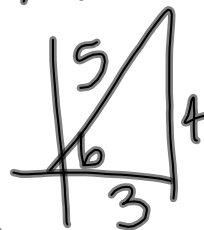
$$\frac{(25-24)(25+24)}{25}$$

~~5/12~~
~~5/12~~

$$64. \sin\left(\underbrace{\sin^{-1}\frac{1}{2}}_a + \underbrace{\cos^{-1}\frac{3}{5}}_b\right)$$



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



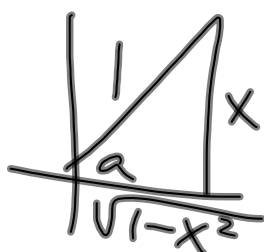
$$= \left(\frac{1}{2}\right)\left(\frac{3}{5}\right) + \left(\frac{\sqrt{3}}{2}\right)\left(\frac{4}{5}\right)$$

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

$$66. \cos\left(\underbrace{\sin^{-1}x}_a - \underbrace{\cos^{-1}y}_b\right)$$

$$= \cos(a-b) = \cos a \cos b + \sin a \sin b$$

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



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

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

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

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

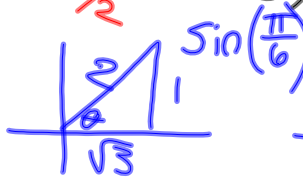
53. $\sin^{-1}(\sin \frac{7\pi}{6})$
 $-\frac{\pi}{6}$

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

55. $\sin(\tan^{-1}(\frac{a}{3}))$
 $\frac{a}{\sqrt{a^2+9}}$

45. $\sin(\tan^{-1} \frac{\sqrt{3}}{3})$
 $\frac{1}{2}$

63. $\cos(\sin^{-1} \frac{\sqrt{2}}{2} + \cos^{-1} \frac{3}{5})$



$\cos(a+b) = \cos a \cos b - \sin a \sin b$
 $(\frac{\sqrt{2}}{2})(\frac{3}{5}) - (\frac{\sqrt{2}}{2})(\frac{4}{5})$
 $\frac{3\sqrt{2} - 4\sqrt{2}}{10} = \frac{-\sqrt{2}}{10}$

$\frac{-\sqrt{2}}{10} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{-2}{10\sqrt{2}} = \frac{-1}{5\sqrt{2}}$

6.5 handout
 # 25-77 odd
 49-53
 odd