

HW # 46 p. 341 33-49 odd 70-75, 80-82

$$33. \sec\left(\frac{\pi}{2} - x\right) = \csc x \leftarrow$$

$$\frac{1}{\cos\left(\frac{\pi}{2} - x\right)} = \frac{1}{\cos\frac{\pi}{2}\cos x + \sin\frac{\pi}{2}\sin x}$$

$$= \frac{1}{0\cos x + 1\cdot\sin x} = \frac{1}{\sin x} = \boxed{\csc x} \checkmark$$

$$35. \cos(\pi - \theta) = -\cos \theta$$

$$\begin{aligned} & \cos\pi\cos\theta + \sin\pi\sin\theta \\ &= -1\cdot\cos\theta + 0\cdot\sin\theta = \boxed{-\cos\theta} \checkmark \end{aligned}$$

$$37. \sin(\pi - \theta) = \sin \theta$$

$$\begin{aligned} & \sin\pi\cos\theta - \cos\pi\sin\theta \\ &= 0\cdot\cos\theta - (-1)\cdot\sin\theta = -(-1)\sin\theta \\ &= 1\cdot\sin\theta \\ &= \boxed{\sin\theta} \checkmark \end{aligned}$$

$$39. \cos(270^\circ - \theta) = -\sin \theta$$

$$\begin{aligned} & \cos 270^\circ \cos \theta + \sin(270^\circ) \sin \theta \\ &= 0\cdot\cos\theta + (-1)\sin\theta = \boxed{-\sin\theta} \checkmark \end{aligned}$$

$$41. \cos(\pi + x) + \cos(\pi + x) = 1$$

$$2(\cos\pi\cos x - \sin\pi\sin x) = 1$$

$$-1 \cdot \cos x - 0 \sin x = \frac{1}{2}$$

$$\frac{-1 \cos x}{-1} = \frac{1}{2}$$

$$\frac{2}{-1} \rightarrow \cos x = -\frac{1}{2}$$

$$\begin{array}{l} x = \frac{2\pi}{3} \\ x = \frac{4\pi}{3} \end{array}$$

$$43. \sin\left(\frac{\pi}{6} + x\right) + \sin\left(\frac{\pi}{6} - x\right) = \frac{1}{2}$$

$$\sin\frac{\pi}{6}\cos x + \cancel{\cos\frac{\pi}{6}\sin x} + \sin\frac{\pi}{6}\cos x - \cancel{\cos\frac{\pi}{6}\sin x} = \frac{1}{2}$$

$$\dots 2\sin\frac{\pi}{6}\cos x = \frac{1}{2}$$

$$2 \cdot \frac{1}{2} \cos x = \frac{1}{2} \rightarrow \cos x = \frac{1}{2}$$

$$\begin{array}{l} x = \frac{\pi}{3} \\ x = \frac{5\pi}{3} \end{array}$$

$$45. \tan(\pi + x) + \tan(\pi + x) = 2$$

$$2\tan(\pi + x) = 2$$

$$\frac{2\left(\frac{\tan\pi + \tan x}{1 - \tan\pi\tan x}\right)}{2} = \frac{2}{2}$$

$$\frac{0 + \tan x}{1 - 0\tan x} = 1$$

$$\frac{\tan x}{1} = 1$$

$$\rightarrow \tan x = 1$$

$$\begin{array}{l} x = \frac{\pi}{4}, \frac{5\pi}{4} \end{array}$$

Start w/ this one ↘

$$49. 2 \sin a \cos b = \sin(a+b) + \sin(a-b)$$

$$\begin{aligned} &\equiv \sin a \cos b + \cos a \sin b + \sin a \cos b - \cos a \sin b \\ &= \boxed{2 \sin a \cos b} \checkmark \end{aligned}$$

$$70. \frac{\cos \theta}{1 - \sin^2 \theta} = \sec \theta$$

$$\frac{\cos \theta}{\cos^2 \theta} = \frac{1}{\cos \theta} = \boxed{\sec \theta} \checkmark$$

$$\overset{\cos \theta}{\cos \theta} \frac{\sec \theta}{\sin \theta} - \frac{\sin \theta \sin \theta}{\cos \theta \sin \theta} = \cot \theta$$

$$\frac{\cos \cdot \frac{1}{\cos}}{\cos \theta \sin \theta} - \frac{\sin^2}{\cos \theta \sin \theta} = \frac{1 - \sin^2}{\cos \theta \sin \theta} = \frac{\cos^2 \theta}{\cos \theta \sin \theta}$$

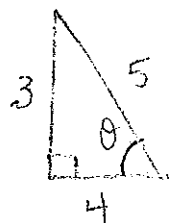
$$\frac{\cos \theta}{\sin \theta} = \boxed{\cot \theta} \checkmark$$

$$72. \sin^{-1}(-1) = -\frac{\pi}{2}$$

$$73. \tan^{-1} \sqrt{3} = \frac{\pi}{3}$$

$$74. \tan(\arcsin \frac{3}{5}) = \tan(\sin^{-1}(\frac{3}{5})) =$$

$$\sin^{-1}(\frac{3}{5}) = \theta$$



$$\boxed{\tan \theta = \frac{3}{4}}$$

75. a. Exponential - the variable is in the exponent.

$$b. A(t) = 1000 \left(1 + \frac{.04}{4}\right)^{4t} = \boxed{A(t) = 1000(1.01)^{4t}}$$

$$c. \$2216.72$$

80. H

$$81. \sin(60^\circ + 45^\circ)$$

$$\sin 60^\circ \cos 45^\circ + \cos 60^\circ \sin 45^\circ$$

$$\frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2} + \frac{1}{2} \cdot \frac{\sqrt{2}}{2}$$

$$= \frac{\sqrt{6}}{4} + \frac{\sqrt{2}}{4} = \frac{\sqrt{6} + \sqrt{2}}{4}$$

(A)

$$82. \frac{\cos \theta (\cot^2 \theta + 1)}{\csc \theta}$$

$$= \frac{\cos \theta \cdot \csc^2 \theta}{\csc \theta} = \cos \theta \csc \theta$$

$$= \cos \theta \cdot \frac{1}{\sin \theta}$$

$$= \frac{\cos \theta}{\sin \theta} = \boxed{\cot \theta}$$

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