Handout 16 Solutions

1)

$$\tan(x)\csc(x)\sec(x)=\frac{\sin x}{\cos x}\cdot\frac{1}{\sin x}\cdot\frac{1}{\cos x}=\frac{1}{\cos^2 x}=\sec^2(x)$$

2)

$$\sec(x)/\csc(x)=\frac{\frac{1}{\cos x}}{\frac{1}{\sin x}}=\frac{\sin x}{\cos x}=\tan(x)$$

3)

$$\sin(x)\sec(x)/\tan(x)=\frac{\sin x\frac{1}{\cos x}}{\frac{\sin x}{\cos x}}=1$$

4)

$$-3.95=\sec(-x)-2\to-1.95=\sec(-x)\to-1.95=\frac{1}{\cos(-x)}$$

$$-1.95=\frac{1}{\cos(x)}\to\cos(x)=-\frac{1}{1.95}\to x=\cos^{-1}\left(-\frac{1}{1.95}\right)$$

$$x\approx 121°,239°$$

5)

$$-9.1=1/\sin(-x)-3.5\to-5.6=-\frac{1}{\sin(x)}\to 5.6=\frac{1}{\sin(x)}\to\sin(x)=\frac{1}{5.6}$$

$$x=\sin^{-1}\left(\frac{1}{5.6}\right)$$

$$x=10.3°,\,349.7°$$

6)

$$\csc\left(90°-x\right)\sec(x)=\sec(x)\sec(x)=\sec^2(x)$$

7)

$$\tan\left(90°-x\right)/\sin\left(90°-x\right)=\frac{ctn(x)}{\cos(x)}=\frac{\frac{\cos(x)}{\sin(x)}}{\cos(x)}=\frac{1}{\sin(x)}=\csc(x)$$

8)

$\cos^2(x) + 4\cos(x) - 5 = 0$

$(\cos(x) + 5)(\cos(x) - 1) = 0$

$\cos(x) = -5$ (Impossible

$\cos(x) = -1$

$x = 180°$

9)

$3\sin^2(\theta) - 10\sin(\theta) = 6\sin(\theta) - 12$

$3\sin^2(\theta) - 16\sin(\theta) + 12 = 0$

$\sin(\theta) = \dfrac{16 \pm \sqrt{256 - 144}}{6} \approx 4.43, 0.9028$

$\sin(\theta) = 4.43$ (Impossible

$\sin(\theta) = 0.9028$

$\theta \approx 64°, 396°$