Warm-up #9:
Solving Trig Equations

Ex. Solve: $[0, 2\pi)$

1. $-3\sqrt{3}+2+3\cot\theta=2+6\cot\theta$

$-3\sqrt{3}+3\cot\theta=6\cot\theta$

$\frac{-3\sqrt{3}}{3}=\frac{3\cot\theta}{3}$

$-\sqrt{3}=\cot\theta$

$\theta=\frac{5\pi}{6}, \frac{11\pi}{6}$

2. $\cot\theta+\csc\theta=1+2\csc\theta$

$\cot\theta-\csc\theta=1$

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

$(\sin\theta)\frac{\cos\theta-1}{\sin\theta}=1(\sin\theta)$

$(\cos\theta-1)^2=(\sin\theta)^2$

$(\cos\theta-1)(\cos\theta-1)=\sin^2\theta$

$\cos^2\theta-2\cos\theta+1=1-\cos^2\theta$

$2\cos^2\theta-2\cos\theta=0$

$2\cos\theta(\cos\theta-1)=0$

$2\cos\theta=0 \quad \cos\theta-1=0$

$\cos\theta=0 \quad \cos\theta=1$

$\theta=\frac{\pi}{2}, \frac{3\pi}{2} \quad \theta=\emptyset$

Extraneous

↓

Test 0 in cot x

$\cot 0=\frac{1}{0}=\emptyset$

undefined