Solving More Trig. Equations

Solve for θ in $[0°, 360°)$ $0° \le \theta < 360°$

$[0, 2\pi)$

(1) $2\cos\theta - 3 = 2\sec\theta$

$(\cos\theta)\ 2\cos\theta - 3 = 2 \cdot \frac{1}{\cos\theta}\ (\cos\theta)$

$2\cos^2\theta - 3\cos\theta = 2$

$-2 \quad -2$

$2\cos^2\theta - 3\cos\theta - 2 = 0 \quad M = -4$

$2\cos^2\theta - 4\cos\theta + 1\cos\theta - 2 = 0 \quad -4 \cdot 1$

GCF?

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

GCF?

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

$\cos\theta - 2 = 0$

$\cos\theta = 2$

No Solution

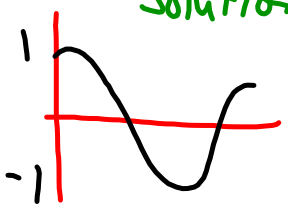
$2\cos\theta + 1 = 0$

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

ref $\measuredangle = 60$

$180 - 60 = 120$

$180 + 60 = 240$



② $2\cos^2\theta = \sin\theta$

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

$2 - 2\sin^2\theta = \sin\theta$

$-2 + 2\sin^2\theta \qquad -2 + 2\sin^2\theta$

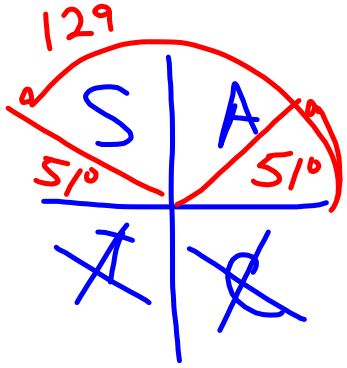
$0 = \underset{a}{2}\sin^2\theta + \underset{b}{1}\sin\theta - \underset{c}{2}$

$$\sin\theta = \frac{-b \pm \sqrt{b^2-4ac}}{2a} = \frac{-1 \pm \sqrt{1^2-4(2)(-2)}}{2(2)}$$

$$\sin\theta = \frac{-1 \pm \sqrt{1+16}}{4} = \frac{-1 \pm \sqrt{17}}{4}$$

$\sin\theta = \frac{1}{2}$

$\sin\theta = \frac{(-1+\sqrt{17})}{4}$ | $\sin\theta = \frac{(-1-\sqrt{17})}{4}$



$\theta = 51°, 129°$

No Solution

③ $2\sec^2\theta - 4 = -7\tan\theta$

$2(1+\tan^2\theta) - 4 = -7\tan\theta$

$\sec^2\theta = 1+\tan^2\theta$

③ $2\sec^2\theta - 4 = -7\tan\theta$

$2(1+\tan^2\theta) - 4 = -7\tan\theta$

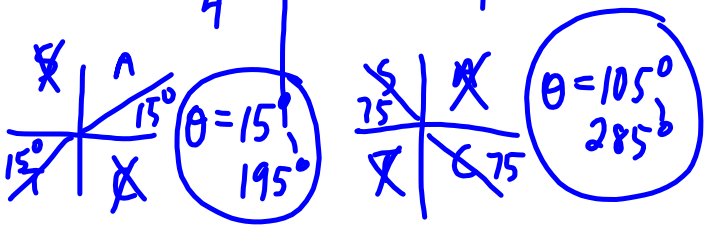
$2 + 2\tan^2\theta - 4 = -7\tan\theta$

$2\tan^2\theta - 2 = -7\tan\theta$

$2\tan^2\theta + 7\tan\theta - 2 = 0$

$\tan\theta = \frac{-7 \pm \sqrt{7^2 - 4(2)(-2)}}{2(2)} = \frac{-7 \pm \sqrt{65}}{4}$

$\tan\theta = \frac{-7+\sqrt{65}}{4}$ $\quad \tan\theta = \frac{-7-\sqrt{65}}{4} \approx -3.76\ldots$



④ $\csc^2\theta + \cot\theta = 1$

$(1+\cot^2\theta) + \cot\theta = 1$

$1 + \cot^2\theta + \cot\theta - 1 = 0$

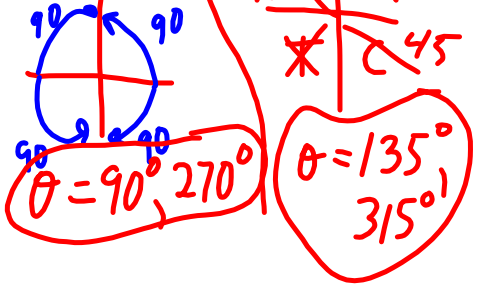
$\cot^2\theta + \cot\theta = 0$

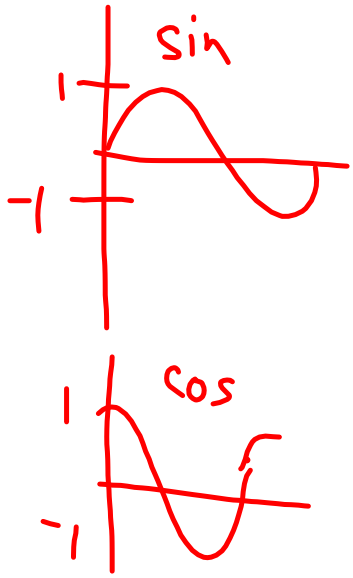
$\cot\theta(\cot\theta + 1) = 0$

$\cot\theta = 0$ $\quad \cot\theta + 1 = 0$

$\frac{\cos\theta}{\sin\theta} = 0$ $\quad \cot\theta = -1$

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




Sin
1
-1
Cos
1
-1

⑤ $\sin\theta = \sin\theta\tan\theta$

HW Pg. 459-460
#10, 12, 13, 21, 22, 25, 26, 40, 42, 46