	30	45	60
sin	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
cos	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$
tan	$\frac{\sqrt{3}}{3}$	1	3

	0	90	180	270
sin	0	1	0	-1
cos	1	0	-1	0
tan	0	U	0	U

Name Schlansky
Mr. Schlansky

Date
Algebra II

Second Degree Trig Equations

1. In the interval $0° \le \vartheta < 360°$, find to the nearest degree all values of ϑ that satisfy the equation $\tan^2 \vartheta - 5\tan\vartheta + 6 = 0$

$X = \tan\theta$ $\quad X^2 - 5X + 6 = 0$

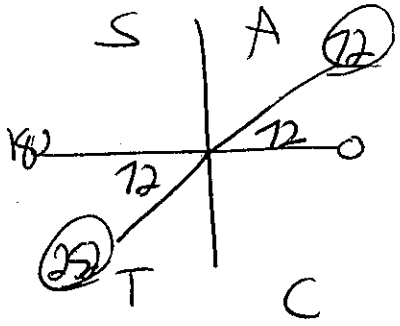
$(X-3)(X-2) = 0$

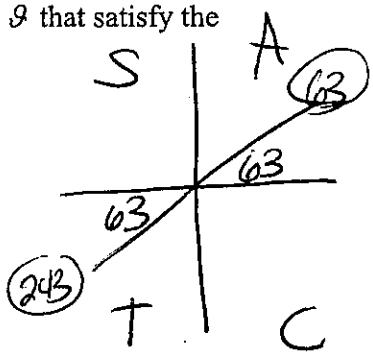
$X = 3$ $\quad X = 2$

$\tan^{-1}\tan\theta = 3$ $\quad \tan^{-1}\tan\theta = 2$

$\theta = \tan^{-1}(3)$ $\quad \theta = \tan^{-1}(2)$

$RQ = 72°$ $\quad RQ = 63°$





$\theta = 63°, 72°, 243°, 252°$

2. Find all values of θ in the interval $0° \le \theta \le 360°$ that satisfy the equation $\sin^2 \vartheta - 1 = 0$

$X = \sin\theta$ $\quad X^2 - 1 = 0$

$(X+1)(X-1) = 0$

$X = -1$ $\quad X = 1$

$\sin^{-1}\sin\theta = -1$ $\quad \sin^{-1}\sin\theta = 1$

$\theta = 270°$ $\quad \theta = 90°$

3. In the interval $0° \le \vartheta < 360°$, find to the nearest degree all values of ϑ that satisfy the equation $\sec^2 \theta - 5\sec\theta = -6$.

$X = \sec\theta$

$X^2 - 5X = -6$

$+6 \quad +6$

$X^2 - 5X + 6 = 0$

$(X-3)(X-2) = 0$

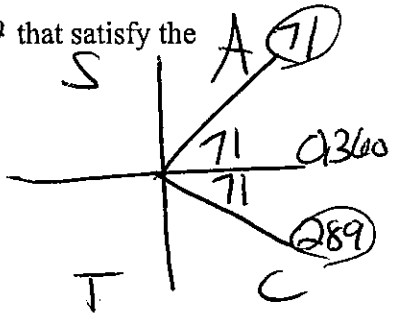
$X = 3$ $\quad X = 2$

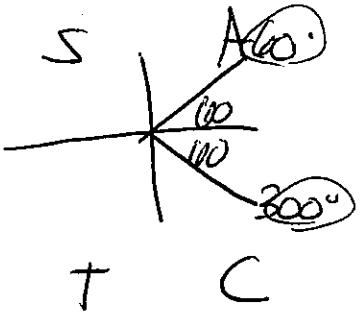
$\sec\theta = 3$ $\quad \sec\theta = 2$

$\cos^{-1}\sec\theta = \cos^{-1}\frac{1}{3}$ $\quad \cos^{-1}\sec\theta = \cos^{-1}\frac{1}{2}$

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

$RQ = 71$ $\quad RQ = 60$





$\theta = 60°, 71°, 289°, 300°$

4. Find, to the *nearest degree*, all values of θ in the interval $0° \le \theta \le 360°$ that satisfy the equation $8\cos^2\theta - 2\cos\theta - 1 = 0$

$\cos\theta = x$ $\quad 8x^2 - 2x - 1 = 0$ $\quad -8$

$8x^2 - 4x + 2x - 1$

$4x(2x-1) + 1(2x-1)$

$(4x+1)(2x-1) = 0$

$4x+1=0 \quad | \quad 2x-1=0$

$4x+1=0 \quad 2x-1=0$

$-1 \quad -1 \quad +1 \quad +1$

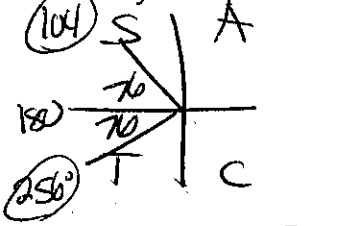
$\frac{4x}{4} = \frac{-1}{4} \quad \frac{2x}{2} = \frac{1}{2}$

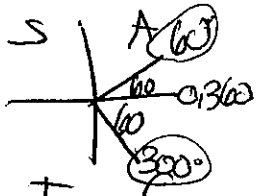
$x = -\frac{1}{4} \quad x = \frac{1}{2}$

$\cos^{-1}\cos\theta = \cos^{-1}\left(-\frac{1}{4}\right) \quad \cos^{-1}\cos\theta = \cos^{-1}\left(\frac{1}{2}\right)$

$\theta = \cos^{-1}\left(-\frac{1}{4}\right) \quad \theta = \cos^{-1}\left(\frac{1}{2}\right)$

$RO = 76 \quad RO = 60$





$\theta = 60°, 104°, 256°, 300°$

5. Which values of x in the interval $0° \le x < 360°$ satisfy the equation $2\sin^2 x + \sin x - 1 = 0$?

$\sin x = x$ $\quad 2x^2 + x - 1 = 0$ $\quad -2$

$2x^2 + 2x - 1x - 1$

$2x(x+1) - 1(x+1)$

$(2x-1)(x+1) = 0$

$2x-1=0 \quad | \quad x+1=0$

$+1 \quad +1 \quad -1 \quad -1$

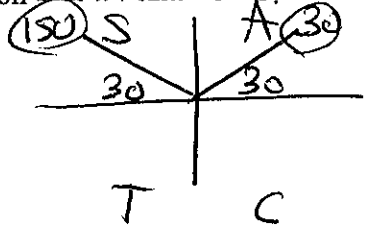
$\frac{2x}{2} = \frac{1}{2} \quad x = -1$

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

$\sin^{-1}\sin x = \sin^{-1}\frac{1}{2} \quad \sin^{-1}\sin x = \sin^{-1}-1$

$x = \sin^{-1}\left(\frac{1}{2}\right) \quad x = \sin^{-1}(-1)$

$Rx = 30 \quad x = 270°$



$x = 30°, 150°, 270°$

6. In the interval $0° \le \vartheta < 360°$, find to the nearest degree all values of ϑ that satisfy the equation $\sin\theta = 3\csc\theta + 2$.

Need a common trig function

$\sin\theta = 3\left(\frac{1}{\sin\theta}\right) + 2$

$\sin\theta = \frac{3}{\sin\theta} + 2$

$x = \sin\theta$

$x\left(x = \frac{3}{x}\right) + (2)x$

$x^2 = 3 + 2x$

$-2x \quad -3 \quad -2x$

$x^2 - 2x - 3 = 0$

$(x-3)(x+1) = 0$

$x = 3 \quad x = -1$

$\sin^{-1}\sin\theta = 3 \quad \sin^{-1}\sin\theta = -1$

$\theta = \sin^{-1}(3) \quad \theta = 270°$

NS