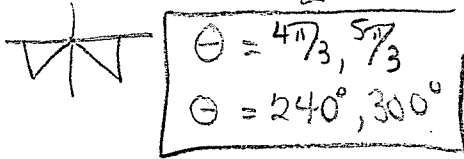


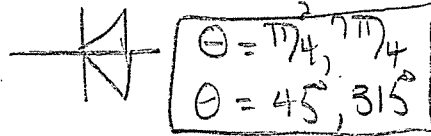
Unit #6: Trig Identities

Solve each equation for all possible primary solutions in the interval $0 \leq \theta < 2\pi$. You may use your unit circle, but not your graphing calculator.

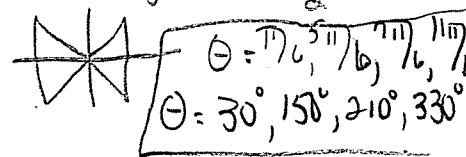
1. $2\sin\theta = -\sqrt{3}$
 $\sin\theta = -\frac{\sqrt{3}}{2}$



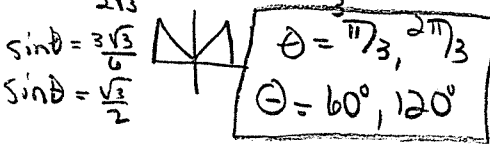
2. $2\cos\theta - \sqrt{2} = 0$
 $2\cos\theta = \sqrt{2}$
 $\cos\theta = \frac{\sqrt{2}}{2}$



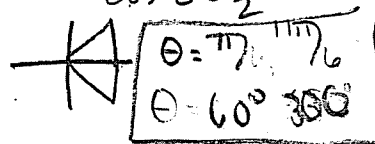
3. $4\sin^2\theta = 1$
 $\sin^2\theta = \frac{1}{4}$
 $\sin\theta = \pm \frac{1}{2}$



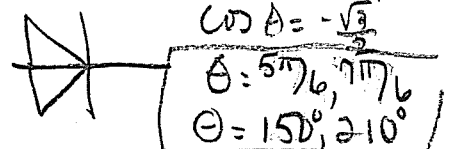
4. $3\csc\theta - \sqrt{3} = \sqrt{3}$
 $3\csc\theta = 2\sqrt{3}$
 $\csc\theta = \frac{2\sqrt{3}}{3}$
 $\sin\theta = \frac{3}{2\sqrt{3}}$
 $\sin\theta = \frac{\sqrt{3}}{2}$



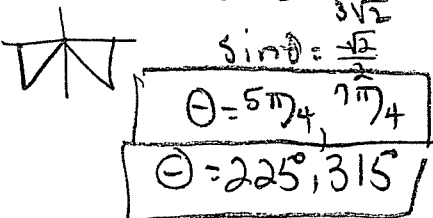
5. $\sec\theta - 1 = 1$
 $\sec\theta = 2$
 $\cos\theta = \frac{1}{2}$



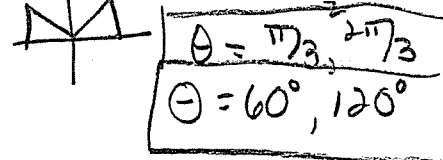
6. $4\cos\theta + 3\sqrt{3} = \sqrt{3}$
 $4\cos\theta = -2\sqrt{3}$
 $\cos\theta = -\frac{\sqrt{3}}{2}$



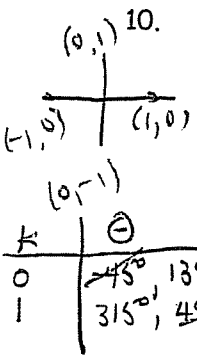
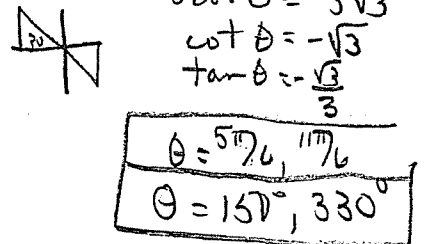
7. $3\sqrt{2}\sin\theta + 2 = -1$
 $3\sqrt{2}\sin\theta = -3$
 $\sin\theta = -\frac{3}{3\sqrt{2}}$
 $\sin\theta = -\frac{\sqrt{2}}{2}$



8. $3\sin\theta - \sin\theta = \sqrt{3}$
 $2\sin\theta = \sqrt{3}$
 $\sin\theta = \frac{\sqrt{3}}{2}$



9. $5\cot\theta + 3\sqrt{3} = -2\sqrt{3}$
 $5\cot\theta = -5\sqrt{3}$
 $\cot\theta = -\sqrt{3}$
 $\tan\theta = -\frac{\sqrt{3}}{3}$



10. $\tan(x + \frac{\pi}{4}) = 0$
 $x + \frac{\pi}{4} = 0^\circ + 360^\circ k$
 $x = -45^\circ + 360^\circ k$
 $x + \frac{\pi}{4} = 180^\circ + 360^\circ k$
 $x = 135^\circ + 360^\circ k$
 $\theta = 135^\circ, 315^\circ$

11. $\cos(\theta - \frac{\pi}{3}) = \frac{1}{2}$

k	θ
0	$120^\circ, 340^\circ$
1	$480^\circ, 720^\circ$

$\theta - \frac{\pi}{3} = 60^\circ + 360^\circ k$
 $\theta = 120^\circ + 360^\circ k$
 $\theta - \frac{\pi}{3} = 300^\circ + 360^\circ k$
 $\theta = 360^\circ + 360^\circ k$
 $\theta = 120^\circ$

12. $\sin(2\theta) = \frac{\sqrt{2}}{2}$
 $2\theta = 45^\circ + 360^\circ k$
 $\theta = 22.5^\circ + 180^\circ k$
 $2\theta = 135^\circ + 360^\circ k$
 $\theta = 67.5^\circ + 180^\circ k$

k	θ
0	$22.5^\circ, 67.5^\circ$
1	$202.5^\circ, 247.5^\circ$
2	$382.5^\circ, 427.5^\circ$

$\theta = 22.5^\circ, 67.5^\circ, 202.5^\circ, 247.5^\circ$

13. $\sqrt{3}\sec(\theta - 10^\circ) = 2$
 $\sec(\theta - 10^\circ) = \frac{2}{\sqrt{3}}$
 $\cos(\theta - 10^\circ) = \frac{\sqrt{3}}{2}$

k	θ
0	$40^\circ, 340^\circ$
1	$400^\circ, 700^\circ$

$\theta - 10^\circ = 30^\circ + 360^\circ k$
 $\theta = 40^\circ + 360^\circ k$
 $\theta - 10^\circ = 330^\circ + 360^\circ k$
 $\theta = 340^\circ + 360^\circ k$
 $\theta = 40^\circ, 340^\circ$

14. $\tan(2\theta) = \sqrt{3}$

k	θ
0	$30^\circ, 120^\circ$
1	$210^\circ, 300^\circ$

$2\theta = 60^\circ + 360^\circ k$
 $\theta = 30^\circ + 180^\circ k$
 $2\theta = 240^\circ + 360^\circ k$
 $\theta = 120^\circ + 180^\circ k$
 $\theta = 30^\circ, 120^\circ, 210^\circ, 300^\circ$

15. $\tan(\frac{\theta}{2} + \frac{\pi}{4}) = \sqrt{3}$

k	θ
0	$30^\circ, 390^\circ$
1	---

$\frac{\theta}{2} + 45^\circ = 60^\circ + 360^\circ k$
 $\frac{\theta}{2} = 15^\circ + 360^\circ k$
 $\theta = 30^\circ + 720^\circ k$
 $\frac{\theta}{2} + 45^\circ = 240^\circ + 360^\circ k$
 $\frac{\theta}{2} = 195^\circ + 360^\circ k$
 $\theta = 390^\circ + 720^\circ k$
 $\theta = 30^\circ$