1. Solve for $x$, $0 \leq x < 2\pi$:

$$2(2 \tan x - 1) = \tan x + 1$$

2. Find the exact value of $\sin 165^\circ$.

(Hint: $165^\circ = 120^\circ + 45^\circ$.)

3. Find the exact value of $\cos 255^\circ$.

(Hint: $255^\circ = 300^\circ - 45^\circ$.)
4. Solve for $x$, $0 \leq x < 2\pi$: $2\sin^2 x - 3\sin x + 1 = 0$

5. Solve for $x$, $0 \leq x < 2\pi$: $\sin^2 x - \sin x \cos x = 0$
6. Solve for $x, \ 0 \leq x < 2\pi$: \[3\tan x - \cot x = 0\]

7. Solve for $x, \ 0 \leq x < 2\pi$: \[
\cos(2x) + \cos x = 0
\]
8. Solve for $\theta$, $0^\circ \leq \theta < 360^\circ$: $\tan(4\theta) - \sqrt{3} = 0$

9. Verify the following identity. Be sure to show all steps for full credit.

$$(\sin \theta + \cos \theta)^2 = 1 + \sin(2\theta)$$
10. Verify the following identity. Be sure to show all steps for full credit.

\[ \tan \theta \sin \theta + \cos \theta = \sec \theta \]

11. Verify the following identity. Be sure to show all steps for full credit.

\[ \frac{1}{1 - \cos \theta} + \frac{1}{1 + \cos \theta} = 2 \csc^2 \theta \]
12. Verify the following identity. Be sure to show all steps for full credit.
\[
\frac{\cos \theta + 1}{\cot \theta} = \sin \theta + \tan \theta
\]

13. Verify the following identity. Be sure to show all steps for full credit.
\[
\frac{\sin^2 \theta - \tan^2 \theta}{1 - \sec^2 \theta} = \sin^2 \theta
\]
1. \( x = \pi/4, \ 5\pi/4 \)

2. \( \frac{\sqrt{3} - 1}{2\sqrt{2}} \)

3. \( \frac{1 - \sqrt{3}}{2\sqrt{2}} \)

4. \( x = \pi/6, \ 5\pi/6, \ \pi/2 \)

5. \( x = 0, \ \pi, \ \pi/4, \ 5\pi/4 \)

6. \( x = \pi/6, \ 5\pi/6, \ 7\pi/6, \ 11\pi/6 \)

7. \( x = \pi/3, \ 5\pi/3, \ \pi \)

8. \( \theta = 15^\circ, \ 105^\circ, \ 195^\circ, \ 285^\circ, \ 60^\circ, \ 150^\circ, \ 240^\circ, \ 330^\circ \)