Math 140  Classwork  23

\[ \sin^2 x + \cos^2 x = 1 \quad \sin^2 x = 1 - \cos^2 x \quad \cos^2 x = 1 - \sin^2 x \]
\[ \tan(0) = 0, \quad \tan\left(\frac{\pi}{6}\right) = \frac{1}{\sqrt{3}}, \quad \tan\left(\frac{\pi}{4}\right) = 1, \quad \tan\left(\frac{\pi}{3}\right) = \sqrt{3} \]

9. Solve for \( \theta \). \( \sin^2 \theta + 2 \cos^2 \theta = 0 \)
Divide by everything by \( \cos^2 \theta \).
Rewrite in terms of \( \tan \theta \).

Solve for \( \theta \). (Write “no solutions” if there are none.)

10. Solve for \( x \). \( \sin^2 x + \cos x = 1 \)  Should be three sets of solutions.
Rewrite in terms of just \( \sin \) or just \( \cos \), not both.
Since \( \sin^2 x + \cos^2 x = 1 \), you can solve for \( \sin^2 x \) in terms of \( \cos^2 x \) or \( \cos^2 x \) in terms of \( \sin^2 x \) getting
\[ \sin^2 x = 1 - \cos^2 x \] and
\[ \cos^2 x = 1 - \sin^2 x \]
Use one of these equations to rewrite the given equation above entirely in terms of \( \sin \) or entirely in terms of \( \cos \).

Now solve for \( x \).