Math 30P **Trigonometric Equations**

Solve the following equations. Show all steps of work. ~~Hand this in ASAP~~. All answers should either be expressed in exact form or rounded to the nearest hundredth where necessary.

1. Solve for $0 < \theta \leq 2\pi$
   a) $\sin^2(\theta) - 1 = 0$
   b) $2\cos^2(\theta) - 3\cos(\theta) - 2 = 0$

2. Find the general solution to each of the following.
   a) $2\sin(x) + 1 = 0$
   b) $\sec(\theta) = \sqrt{2}$

3. Solve for β where $0^0 < \beta \leq 360^0$.
   a) $\sin(2\beta) = \frac{\sqrt{3}}{2}$
   b) $4\cos^2(\beta) - \cos(\beta) = 0$
   c) $\cot^2(\beta) = 4$
   d) $2\sin(\beta)\cos(\beta) - \cos(\beta) = 0$

4. Solve for α where $0 < \alpha \leq 2\pi$.
   a) $\tan(\frac{1}{2}\alpha) = 1$
   b) $2\sin^2(\alpha) + 7\sin(\alpha) - 4 = 0$
   c) $4\sin(\alpha) + 4 = 3\sin(\alpha) + 3$
   d) $\tan(3\alpha) = -1$

Answers:

1a) $\theta = \frac{\pi}{2}, \frac{3\pi}{2}$

b) $\theta = \frac{2\pi}{3}, \frac{4\pi}{3}$

2a) $x = \frac{7\pi}{6} + 2\pi n$ and $\frac{11\pi}{6} + 2\pi n$ where $n \in I$

b) $\theta = \frac{\pi}{4} + 2\pi n$ and $\frac{7\pi}{4} + 2\pi n$

3a) $\beta = 30°, 60°, 210°, 240°$

b) $\beta = 90°, 270°, 75.51°, 284.48°$

c) $\beta = 26.57°, 206.57°, 153.43°, 333.43°$

d) $\beta = 90°, 270°, 30°, 150°$

4a) $\alpha = \frac{\pi}{2}$

b) $\alpha = \frac{\pi}{6}, \frac{5\pi}{6}$

c) $\alpha = \frac{3\pi}{2}$

d) $\alpha = \frac{\pi}{4}, \frac{7\pi}{12}, \frac{11\pi}{12}, \frac{5\pi}{4}, \frac{19\pi}{12}, \frac{23\pi}{12}$