Solve each equation over the interval: $0 \le x < 2\pi$ or in the situation involving inverse functions, the solution must be within the proper range. Write your answers in ascending order. Draw a "circle solution". No calculators.

a) $2\sin^2 x - 1 = -\sin x$

b) $2\cos^2 x = \sin x - 1$

c) $\cot^2 x = \cot x$

d) $\cot x \tan 2x = 3$

e) $2\sin^2 x - \sqrt{3}\sin x = 0$

f) $2\sin x \cos x = \sin x$

g) $\cos x - 2\sin^2 x + 2 = 0$

h) $\sin x \cos x + \cos x - 1 - \sin x = 0$

i) $\sqrt{3}\tan x = -1$

j) $2\cos^2 x = \cos x$

k) $\cos^2 x - \sin^2 x = 1$

l) $\cos 2x = \sin x$

m) $\csc^2 x + 2\csc x = 0$

n) $-\sqrt{3}\sin x - \cos x = 1$

o) $\sin 2x + \cos 2x - 1 = 0$

p) $\sin x + \cos x = 1$

q) $2\sin\left(x - \frac{\pi}{6}\right) = \sqrt{3}\sin x$

r) $2\cos 2x + \sin 2x \sec x = 0$

s) $\sin 2x + \cos x + 2\sin x = -1$

t) $\sin(\pi - 2x) = \cos x$

u) $\tan\left(\pi + \sin^{-1}\frac{2}{3}\right) = x$

v) $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right) = \frac{\pi}{2} - \sin^{-1} 3x$

w) $\tan^2 3x = 1$

x) $\cos 2x + \sin x - 1 = 0$

y) $\sqrt{3}\tan x = 2\dfrac{\sin^2 x}{\cos x}$

z) $\cot x \tan 2x = 3$

A list of answers follows on the next page --- unfortunately those answers are in the wrong order. I suggest you check off each set of answers as you find them to verify you have the proper solutions.

1. $\frac{\pi}{2}$

2. $0,\frac{\pi}{3},\pi,\frac{5\pi}{3}$

3. $\frac{\pi}{12},\frac{\pi}{4},\frac{5\pi}{12},\frac{7\pi}{12},\frac{3\pi}{4},\frac{11\pi}{12},\frac{13\pi}{12},\frac{5\pi}{4},\frac{17\pi}{12},\frac{19\pi}{12},\frac{7\pi}{4},\frac{23\pi}{12}$

4. $\frac{\pi}{6},\frac{5\pi}{6},\frac{3\pi}{2}$

5. $\frac{\pi}{4},\frac{\pi}{2},\frac{5\pi}{4},\frac{3\pi}{2}$

6. $\frac{\pi}{6},\frac{5\pi}{6},\frac{3\pi}{2}$

7. $\pi,\frac{7\pi}{6},\frac{11\pi}{6}$

8. $0,\frac{\pi}{4},\pi,\frac{5\pi}{4}$

9. $\frac{7\pi}{6},\frac{11\pi}{6}$

10. $\frac{2\sqrt{5}}{5}$

11. $0,\frac{3\pi}{2}$

12. $0,\pi$

13. $\frac{\pi}{6},\frac{5\pi}{6},\frac{7\pi}{6},\frac{11\pi}{6}$

14. $\pi,\frac{5\pi}{3}$

15. $\frac{7\pi}{6},\frac{11\pi}{6}$

16. $\frac{\sqrt{3}}{6}$

17. $\frac{\pi}{2},\frac{2\pi}{3},\frac{4\pi}{3},\frac{3\pi}{2}$

18. $\frac{\pi}{2},\frac{3\pi}{2}$

19. $0,\frac{\pi}{2}$

20. $\frac{5\pi}{6},\frac{11\pi}{6}$

21. $\frac{\pi}{6},\frac{\pi}{2},\frac{5\pi}{6},\frac{3\pi}{2}$

22. $\frac{\pi}{6},\frac{5\pi}{6},\frac{7\pi}{6},\frac{11\pi}{6}$

23. $0,\frac{\pi}{3},\frac{2\pi}{3},\pi$

24. $0,\frac{\pi}{6},\frac{5\pi}{6},\pi$

25. $0,\frac{\pi}{3},\frac{2\pi}{3},\pi$

26. $\frac{\pi}{3},\frac{\pi}{2},\frac{3\pi}{2},\frac{5\pi}{3}$