

1. $0, \frac{\pi}{6}, \frac{5\pi}{6}, \pi, \frac{7\pi}{6}, \frac{11\pi}{6}$

2. $2\pi k, \frac{\pi}{3} + 2\pi k, \frac{5\pi}{3} + 2\pi k$

3. $\frac{\pi}{4} + \pi k$

4.

a) $\theta = \frac{\pi}{3} + 2\pi k$

b) $\frac{\pi}{3}, \frac{7\pi}{3}$

5.

a) All solutions: $\frac{2\pi}{3} + 2\pi k, \pi + 2\pi k, \frac{4\pi}{3} + 2\pi k$; Solutions in $[0, 2\pi)$: $\frac{2\pi}{3}, \pi, \frac{4\pi}{3}$

b) All solutions: $\pi k, \frac{\pi}{4} + \pi k, \frac{3\pi}{4} + \pi k$; Solutions in $[0, 2\pi)$: $0, \frac{\pi}{4}, \frac{3\pi}{4}, \pi, \frac{5\pi}{4}, \frac{7\pi}{4}$

(Note: if you want to be really clever, you can compress $\frac{\pi}{4} + \pi k$ and $\frac{3\pi}{4} + \pi k$ into just $\frac{\pi}{4} + \frac{\pi}{2}k$.)

c) All solutions: $3.53 + 2\pi k, 5.89 + 2\pi k$; Solutions in $[0, 2\pi)$: $3.53, 5.89$

d) All solutions: $\frac{\pi}{6} + \pi k, \frac{\pi}{4} + \pi k$; Solutions in $[0, 2\pi)$: $\frac{\pi}{6}, \frac{\pi}{4}, \frac{7\pi}{6}, \frac{5\pi}{4}$

e) All solutions: $\frac{\pi}{2} + 2\pi k, \frac{11\pi}{6} + 2\pi k$; Solutions in $[0, 2\pi)$: $\frac{\pi}{2}, \frac{11\pi}{6}$

f) All solutions: $2\pi k$; Solutions in $[0, 2\pi)$: 0

g) All solutions: $\frac{\pi}{4} + \pi k$; Solutions in $[0, 2\pi)$: $\frac{\pi}{4}, \frac{5\pi}{4}$

h) All solutions: $\pi + 2\pi k$; Solutions in $[0, 2\pi)$: π

i) All solutions: $\frac{\pi}{2} + \pi k, \frac{\pi}{6} + 2\pi k, \frac{5\pi}{6} + 2\pi k$; Solutions in $[0, 2\pi)$: $\frac{\pi}{6}, \frac{\pi}{2}, \frac{5\pi}{6}, \frac{3\pi}{2}$

j) No solutions

k) All solutions: $\frac{2\pi}{9} + \frac{\pi}{3}k$; Solutions in $[0, 2\pi)$: $\frac{2\pi}{9}, \frac{5\pi}{9}, \frac{8\pi}{9}, \frac{11\pi}{9}, \frac{14\pi}{9}, \frac{17\pi}{9}$

l) All solutions: $\frac{4\pi}{3} + 4\pi k, \frac{8\pi}{3} + 4\pi k$; Solutions in $[0, 2\pi)$: $\frac{4\pi}{3}$