

Solving Trig Equations with Multiple Angles WS

Solve each of the following equations over $[0, 2\pi)$.

1. $\sin 3x = 1$

2. $\cos 2x = \frac{\sqrt{3}}{2}$

3. $\tan 2x = -1$

4. $\sec 3x = 2$

5. $3\cot 3x - 3 = 0$

6. $2\sin 2x + \sqrt{3} = 0$

7. $2\cos 3x + 1 = 0$

8. $\csc 2x + \sqrt{2} = 0$

9. $2\cos^2 2x = 1$

10. $3\tan^2 2x - 1 = 0$

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Answers:

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

2. $\frac{\pi}{12}, \frac{11\pi}{12}, \frac{13\pi}{12}, \frac{23\pi}{12}$

3. $\frac{3\pi}{8}, \frac{7\pi}{8}, \frac{11\pi}{8}, \frac{15\pi}{8}$

4. $\frac{\pi}{9}, \frac{5\pi}{9}, \frac{7\pi}{9}, \frac{11\pi}{9}, \frac{13\pi}{9}, \frac{17\pi}{9}$

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

6. $\frac{2\pi}{3}, \frac{5\pi}{6}, \frac{5\pi}{3}, \frac{11\pi}{6}$

7. $\frac{2\pi}{9}, \frac{4\pi}{9}, \frac{8\pi}{9}, \frac{10\pi}{9}, \frac{14\pi}{9}, \frac{16\pi}{9}$

8. $\frac{5\pi}{8}, \frac{7\pi}{8}, \frac{13\pi}{8}, \frac{15\pi}{8}$

9. $\frac{\pi}{8}, \frac{3\pi}{8}, \frac{5\pi}{8}, \frac{7\pi}{8}, \frac{9\pi}{8}, \frac{11\pi}{8}, \frac{13\pi}{8}, \frac{15\pi}{8}$

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