Short Answer

1. Solve the equation for $\theta$ if $0^\circ \leq \theta < 360^\circ$. Do not use a calculator.
   \[ \sqrt{3} \tan \theta + 1 = 0 \]

2. Solve for $\theta$ if $0^\circ \leq \theta < 360^\circ$.
   \[ 2 \cos^2 \theta + 13 \cos \theta = -\xi \]

3. Use the quadratic formula to find all solutions in the interval $0^\circ \leq \theta < 360^\circ$ to the nearest tenth of a degree.
   \[ 2 \cos^2 \theta + 3 \cos \theta - 1 = 0 \]

4. Use your graphing calculator to find the solutions to the equation to the nearest tenth of a degree in the interval $0^\circ \leq \theta < 360^\circ$ by defining the left side and right side of the equation as functions and then finding the intersection points of their graphs. Make sure your calculator is set to degree mode.
   \[ \sin \theta - 5 = 9 \sin \theta \]

5. Solve the equation for $x$ if $0 \leq x < 2\pi$. Give your answer in radians using exact values only.
   \[ 2 \sin^2 x + \cos x - 1 = 0 \]

6. Solve the equation for $x$ if $0 \leq x < 2\pi$. Give your answer in radians using exact values only.
   \[ 2 \sin x - \cot x - \csc x = 0 \]

7. Solve the equation for $\theta$ if $0^\circ \leq \theta < 360^\circ$. Give your answer in degrees.
   \[ 2 \sin \theta - \sin 2\theta = 0 \]
8. Solve the equation for $\theta$ if $0^\circ \leq \theta < 360^\circ$. Give your answer in degrees.

$$2 \sin \theta - 1 = \csc \theta$$

9. Solve the equation for $\theta$ if $0^\circ \leq \theta < 360^\circ$. Give your answer in degrees.

$$\sqrt{3} \sin \theta + \cos \theta = \sqrt{3}$$

10. Solve the equation for $\theta$ if $0^\circ \leq \theta < 360^\circ$. Give your answer in degrees.

$$\cos \theta + \sqrt{3} \sin \theta = \sqrt{3}$$

11. Solve the equation for $\theta$ if $0^\circ \leq \theta < 360^\circ$. Give your answer in degrees.

$$\cos \frac{\theta}{2} - \cos \theta = 0$$

12. For the equation below, find all degree solutions in the interval $0^\circ \leq \theta < 360^\circ$. Give your answer in degrees. If rounding is necessary, round to the nearest tenth of a degree. Use your graphing calculator to verify each solution graphically.

$$32 \sec^2 \theta - 31 \tan \theta \sec \theta - 20 = 0$$

13. Solving the following equation will require you to use the quadratic formula. Solve the equation for $\theta$ between $0^\circ$ and $360^\circ$, and round your answers to the nearest tenth of a degree.

$$3 \cos^2 \theta + 2 \sin \theta - 1 = 0$$

14. Write an expression that gives all solutions to the equation.

$$\sin x + \cos x = -\sqrt{2}$$
15. Write an expression that gives all solutions to the equation.

\[ \sin x - \cos x = -\sqrt{2} \]

16. Find all solutions if \(0 \leq x < 2\pi\). Give your answers in radians using exact values only. Verify your answer graphically.

\[ \cos 2x = \frac{1}{2} \]

17. Find all solutions if \(0 \leq x < 2\pi\). Give your answers in radians using exact values only.

\[ \sin 2x \cos x + \cos 2x \sin x = \frac{\sqrt{3}}{2} \]

18. Find the smallest positive value of \(t\) for which \(\cos 2\pi t = \frac{1}{\sqrt{2}}\).

19. Find all solutions if \(0^\circ \leq \theta < 360^\circ\). Give your answers in degrees. Verify your answer graphically.

\[ \sin 2\theta = 0 \]

\[ \theta = \underline{\phantom{000}}^\circ \]

20. Use your graphing calculator to find all degree solutions in the interval \(0^\circ \leq \theta < 360^\circ\) for the following equation. Give your answer in degrees.

\[ \cos 3\theta = 0 \]

\[ \theta = \underline{\phantom{000}}^\circ \]
21. Find all solutions if $0^\circ \leq \theta < 360^\circ$. Give your answers in degrees, and round to the nearest tenth.

$$\cos^2 3\theta - 8\cos 3\theta + 6 = 0$$

$\theta = \boxed{\text{degrees}}$

22. Eliminate the parameter $t$ in the following:

$$x = 5 \sec t \quad y = 4 \tan t$$

23. Eliminate the parameter $t$ in the following:

$$x = 9 + 5 \tan t \quad y = 7 + 5 \sec t$$

24. Eliminate the parameter $t$ in the following:

$$x = -\sin t \quad y = -\sin t$$

25. Eliminate the parameter $t$ in the following:

$$x = 5 \sin t \quad y = 8 \sin t$$
Answer Section

SHORT ANSWER

1. 150°, 330°
2. 120°, 240°
3. 73.7°, 286.3°
4. 218.7°, 321.3°
5. 0, \(\frac{2\pi}{3}, \frac{4\pi}{3}\)
6. \(\frac{\pi}{3}, \frac{5\pi}{3}\)
7. 0°, 180°
8. 90°, 210°, 330°
9. 30°, 90°
10. 30°, 90°
11. 0, 240°
12. 48.6°, 52.1°, 126.9°, 131.4°
13. 213.3°, 326.7°
14. \(\frac{5\pi}{4} + 2k\pi\)
15. \(\frac{7\pi}{4} + 2k\pi\)
16. \(\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}\)
17. \(\frac{\pi}{9}, \frac{2\pi}{9}, \frac{7\pi}{9}, \frac{8\pi}{9}, \frac{12\pi}{9}, \frac{14\pi}{9}\)
18. \(t = \frac{1}{8}\)
19. 0, 90, 180, 270
20. 30, 90, 150, 210, 270, 330
21. 11.0, 109.0, 131.0, 229.0, 251.0, 349.0
22. \(\frac{x^2}{25} - \frac{y^2}{16} = 1\)
23. \(\frac{(y-7)^2}{25} - \frac{(x-9)^2}{25} = 1\)
24. \(y = x\)
25. \(8x = 5y\)