

Solving Trigonometric Equations

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the equation on the interval $0 \leq \theta < 2\pi$.

1) $\cos \theta - 1 = 0$

A) 0

B) $\frac{\pi}{2}$

C) π

D) $\frac{3\pi}{2}$

1) _____

2) $5 \csc \theta - 3 = 2$

A) 2π

B) $\frac{\pi}{2}$

C) $\frac{3\pi}{2}$

D) π

2) _____

3) $2 \cos \theta + 1 = 0$

A) $\frac{2\pi}{3}, \frac{4\pi}{3}$

B) $\frac{\pi}{2}, \frac{3\pi}{2}$

C) $\frac{\pi}{3}, \frac{5\pi}{3}$

D) $\frac{3\pi}{2}$

3) _____

4) $7 \csc \theta - 3 = 4$

A) 2π

B) $\frac{\pi}{2}$

C) $\frac{3\pi}{2}$

D) π

4) _____

Solve the equation. Give a general formula for all the solutions.

5) $\cos \theta - 1 = 0$

A) $\theta = \pi + 2k\pi$

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

C) $\theta = 2k\pi$

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

5) _____

6) $\sin \theta = 1$

A) $\theta = 0 + 2k\pi$

B) $\theta = \pi + 2k\pi$

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

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

6) _____

7) $\cos \theta = 1$

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

B) $\theta = \pi + 2k\pi$

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

D) $\theta = 0 + 2k\pi$

7) _____

8) $\sin \theta = \frac{\sqrt{3}}{2}$

A) $\theta = \frac{\pi}{6} + 2k\pi, \theta = \frac{5\pi}{6} + 2k\pi$

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

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

D) $\theta = \frac{\pi}{6} + k\pi, \theta = \frac{5\pi}{6} + k\pi$

8) _____

9) $2 \cos \theta + 1 = 0$

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

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

C) $\theta = \frac{2\pi}{3} + 2k\pi, \theta = \frac{4\pi}{3} + 2k\pi$

D) $\theta = \frac{2\pi}{3} + k\pi, \theta = \frac{4\pi}{3} + k\pi$

9) _____

Find all solutions of the equation.

10) $\tan x = -1$

A) $x = \frac{\pi}{4} + 2n\pi$

B) $x = \frac{3\pi}{4} + n\pi$

C) $x = \frac{3\pi}{4} + 2n\pi$

10) _____

11) $2 \sin x + 1 = 0$

A) $x = \frac{7\pi}{6} + n\pi$ or $x = \frac{11\pi}{6} + n\pi$

B) $x = \frac{\pi}{6} + n\pi$ or $x = \frac{5\pi}{6} + n\pi$

C) $x = \frac{\pi}{6} + 2n\pi$ or $x = \frac{5\pi}{6} + 2n\pi$

D) $x = \frac{7\pi}{6} + 2n\pi$ or $x = \frac{11\pi}{6} + 2n\pi$

E) $x = \frac{\pi}{4} + n\pi$

11) _____

Solve the equation on the interval $0 \leq \theta < 2\pi$.

12) $2 \cos \theta + 3 = 2$

A) $\left\{ \frac{2\pi}{3}, \frac{4\pi}{3} \right\}$

B) $\left\{ \frac{2\pi}{3}, \frac{5\pi}{3} \right\}$

C) $\left\{ \frac{5\pi}{6}, \frac{11\pi}{6} \right\}$

D) $\left\{ \frac{5\pi}{6}, \frac{7\pi}{6} \right\}$

12) _____

13) $4 \sin^2 \theta = 1$

A) $\left\{ \frac{\pi}{3}, \frac{2\pi}{3} \right\}$

C) $\left\{ \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3} \right\}$

B) $\left\{ \frac{\pi}{6}, \frac{5\pi}{6} \right\}$

D) $\left\{ \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6} \right\}$

13) _____

14) $4 \cos^2 x - 3 = 0$

A) $\left\{ \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3} \right\}$

C) $\left\{ \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6} \right\}$

B) $\left\{ \frac{\pi}{3}, \frac{5\pi}{3} \right\}$

D) $\left\{ \frac{\pi}{6}, \frac{11\pi}{6} \right\}$

14) _____

15) $4 \sin^2 \theta - 3 = 0$

A) $\left\{ \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6} \right\}$

C) $\left\{ \frac{\pi}{6}, \frac{5\pi}{6} \right\}$

B) $\left\{ \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3} \right\}$

D) $\left\{ \frac{\pi}{3}, \frac{2\pi}{3} \right\}$

15) _____

$$16) 2 \cos^2 \theta - 1 = 0$$

$$A) \left\{ \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4} \right\}$$

$$C) \left\{ \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3} \right\}$$

$$B) \left\{ \frac{\pi}{4}, \frac{7\pi}{4} \right\}$$

$$D) \left\{ \frac{\pi}{3}, \frac{5\pi}{3} \right\}$$

16) _____

Answer Key

Testname: SOLVING TRIGONOMETRIC EQUATIONS

- 1) A
- 2) B
- 3) A
- 4) B
- 5) C
- 6) C
- 7) D
- 8) B
- 9) C
- 10) B
- 11) D
- 12) A
- 13) D
- 14) C
- 15) B
- 16) A