Solve trigonometric equations in radians (0 ≤ x ≤ 2π) worksheet – Grade 12

Grade 12 · Mixed level · 20 questions · **Version X9972**

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1. Solve $-6\cos x - 2 = 2\cos x + 2$ for $0 \le x \le 2\pi$.
   A. x = π/3 or 5π/3 **B.** x = 2π/3 or 4π/3 **C.** x = 3π/4 or 17π/12 **D.** x = 2π/3

2. Solve $5\tan x + 9 = \tan x + 9$ for $0 \le x \le 2\pi$.
   A. x = π/2 or 3π/2 **B.** x = 0 or 2π **C.** x = 0, π or 2π **D.** x = π/12 or 13π/12

3. Solve $-\tan x + 2 = -3\tan x + 2$ for $0 \le x \le 2\pi$.
   A. x = π/12 or 13π/12 **B.** x = 0, π or 2π **C.** x = 11π/12 or 23π/12 **D.** x = π or 2π

4. Solve $\cos x = 1$ for $0 \le x \le 2\pi$.
   A. x = 0 or 2π **B.** x = π **C.** x = 0 **D.** x = π/12

5. Solve $5\sqrt{3}\tan x - 5 = 0$ for $0 \le x \le 2\pi$.
   A. x = π/6 **B.** x = π/6 or 7π/6 **C.** x = π/3 or 4π/3 **D.** x = 2π/3 or 5π/3

6. Solve $2\cos x + \sqrt{2} = 0$ for $0 \le x \le 2\pi$.
   A. x = 3π/4 or 5π/4 **B.** x = 5π/4 **C.** x = 3π/4 **D.** x = 5π/6 or 4π/3

7. Solve $8\cos x + 8 = 5\cos x + 8$ for $0 \le x \le 2\pi$.
   A. x = π/2 or 3π/2 **B.** x = 7π/12 or 19π/12 **C.** x = 0 or π **D.** x = 5π/12 or 17π/12

8. Solve $5\sin(3x) + 9 = 14$ for $0 \le x \le 2\pi$.
   A. x = π/4, 11π/12 or 19π/12 **B.** x = π/3, π or 5π/3 **C.** x = π/6, 5π/6 or 3π/2
   D. x = π/12, 3π/4 or 17π/12

9. Solve $\csc x = -2$ for $0 \le x \le 2\pi$.
   A. x = 7π/6 or 11π/6 **B.** x = 7π/6 **C.** x = 5π/4 or 23π/12 **D.** x = π/3 or 5π/3

10. Solve $\cot x = -1$ for $0 \le x \le 2\pi$.
    A. x = 3π/4 or 7π/4 **B.** x = 7π/4 **C.** x = 2π/3 or 5π/3 **D.** x = 3π/4

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11. Solve $6\cos(4x) = 3\sqrt{2}$ for $0 \le x \le 2\pi$.

    A. x = π/16, 7π/16, 9π/16, 15π/16, 17π/16, 23π/16, 25π/16 or 31π/16

    B. x = 17π/48, 23π/48, 41π/48, 47π/48, 65π/48, 71π/48, 89π/48 or 95π/48

    C. x = 7π/16, 15π/16, 23π/16 or 31π/16 **D.** x = π/16, 9π/16, 17π/16 or 25π/16

12. Solve $4\cos(2x) + 8 = 12$ for $0 \le x \le 2\pi$.

    A. x = 0, π or 2π **B.** x = 11π/12 or 23π/12 **C.** x = π or 2π **D.** x = π/2 or 3π/2

13. Solve $\tan^2 x = 3$ for $0 \le x \le 2\pi$.

    A. x = π/3 or 4π/3 **B.** x = 5π/12, 3π/4, 17π/12 or 7π/4 **C.** x = π/3, 2π/3, 4π/3 or 5π/3

    D. x = 2π/3, 4π/3 or 5π/3

14. Solve $5\cos(3x) - 4 = -9$ for $0 \le x \le 2\pi$.

    A. x = 5π/12, 13π/12 or 7π/4 **B.** x = π/3 or 5π/3 **C.** x = π **D.** x = π/3, π or 5π/3

15. Solve $6\cos x + 3 = 8.4$ for $0 \le x \le 2\pi$. Give the smaller solution in radians, to two decimal places.

    Answer: _____

16. Solve $6\cos x - 3 = 2.4$ for $0 \le x \le 2\pi$. Give the larger solution in radians, to two decimal places.

    Answer: _____

17. Solve $2\sin x + 4 = 3.6$ for $0 \le x \le 2\pi$. Give the larger solution in radians, to two decimal places.

    Answer: _____

18. Solve $2\tan x - 1 = -2.2$ for $0 \le x \le 2\pi$. Give the smaller solution in radians, to two decimal places.

    Answer: _____

19. Solve $2\cos x - 2 = -1.6$ for $0 \le x \le 2\pi$. Give the smaller solution in radians, to two decimal places.

    Answer: _____

20. Solve $3\tan x - 4 = -8.8$ for $0 \le x \le 2\pi$. Give the larger solution in radians, to two decimal places.

    Answer: _____

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Answer key · Version X9972

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1. **B (x = 2π/3 or 4π/3)**
2. **C (x = 0, π or 2π)**
3. **B (x = 0, π or 2π)**
4. **A (x = 0 or 2π)**
5. **B (x = π/6 or 7π/6)**
6. **A (x = 3π/4 or 5π/4)**
7. **A (x = π/2 or 3π/2)**
8. **C (x = π/6, 5π/6 or 3π/2)**
9. **A (x = 7π/6 or 11π/6)**
10. **A (x = 3π/4 or 7π/4)**
11. **A (x = π/16, 7π/16, 9π/16, 15π/16, 17π/16, 23π/16, 25π/16 or 31π/16)**
12. **A (x = 0, π or 2π)**
13. **C (x = π/3, 2π/3, 4π/3 or 5π/3)**
14. **D (x = π/3, π or 5π/3)**
15. **0.45**
16. **5.83**
17. **6.08**
18. **2.60**
19. **1.37**
20. **5.27**

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