Math 30-1: Trigonometry Two
PRACTICE EXAM

1. The general solution of $\tan\theta = 0$ is:

A. $\theta = \frac{\pi}{4} + n\pi, n \in I$

B. $\theta = \frac{\pi}{4} + n\left(\frac{\pi}{2}\right), n \in I$

C. $\theta = \frac{\pi}{2} + n\pi, n \in I$

D. $\theta = n\pi, n \in I$

2. Over the domain $0 \le \theta \le 2\pi$, the equation $\cos\theta = 2$ has:

A. Solutions at $\theta = \frac{\pi}{3}, \frac{5\pi}{3}$.

B. Solutions at $\theta = \frac{2\pi}{3}, \frac{4\pi}{3}$.

C. Solutions at (0, 2), (π, 2), and (2π, 2).

D. No solution. The graph of $y = \cos\theta$ and the graph of $y = 2$ have no point of intersection.

3. The general solution of $\cos\theta = -\frac{\sqrt{3}}{2}$ is:

A. $\theta = 30^\circ + n(360^\circ)$ and $\theta = 150^\circ + n(360^\circ), n \in I$

B. $\theta = 150^\circ + n(360^\circ)$ and $\theta = 210^\circ + n(360^\circ), n \in I$

C. $\theta = 150^\circ + n(360^\circ)$ and $\theta = 330^\circ + n(360^\circ), n \in I$

D. $\theta = 150^\circ + n(180^\circ), n \in I$

4. Over the domain $0 \le \theta \le 2\pi$, the equation $\cos\theta = \frac{1}{2}$ has:

A. No solution.

B. Solutions at the θ-intercepts of $y = 2\cos\theta - 1$.

C. The solutions $\theta = \frac{\pi}{6}, \frac{5\pi}{6}$.

D. The solutions $\theta = \frac{2\pi}{3}, \frac{5\pi}{3}$.

5. Which of the following techniques **cannot** be used to solve $\sin\theta = -0.30$?

A. Solving with the $\sin^{-1}$ feature of a calculator.

B. Finding angles on the unit circle.

C. Finding point(s) of intersection.

D. Finding θ-intercepts.

6. The general solution of $\sec\theta = -2$ is:

A. $\theta = \frac{5\pi}{6} + n(2\pi)$ and $\theta = \frac{7\pi}{6} + n(2\pi)$, $n \in I$

B. $\theta = \frac{\pi}{3} + n(2\pi)$ and $\theta = \frac{2\pi}{3} + n(2\pi)$, $n \in I$

C. $\theta = \frac{2\pi}{3} + n(2\pi)$ and $\theta = \frac{4\pi}{3} + n(2\pi)$, $n \in I$

D. No solution.

7. $\csc\theta$ is undefined at:

A. $\theta = \frac{\pi}{4} + n\left(\frac{\pi}{2}\right)$, $n \in I$

B. $\theta = \frac{\pi}{2} + n\pi$, $n \in I$

C. $\theta = n\pi$, $n \in I$

D. $\theta = n(2\pi)$, $n \in I$

8. Over the domain $0^\circ \leq \theta \leq 360^\circ$, the equation $\sec\theta = -2.3662$ has solutions of:

A. $\theta = 115^\circ, 245^\circ$

B. $\theta = 120^\circ, 240^\circ$

C. $\theta = 125^\circ, 235^\circ$

D. $\theta = 130^\circ, 230^\circ$

9. Over the domain $0 \le \theta \le 2\pi$, the equation $2\sin\theta\cos\theta = \cos\theta$ has solutions of:

A. $\theta = \frac{\pi}{6}, \frac{5\pi}{6}$ **C.** $\theta = \frac{\pi}{6}, \frac{\pi}{2}, \frac{5\pi}{6}, \frac{3\pi}{2}$

B. $\theta = \frac{\pi}{3}, \frac{2\pi}{3}$ **D.** $\theta = \frac{\pi}{3}, \frac{\pi}{2}, \frac{2\pi}{3}, \frac{3\pi}{2}$

10. Over the domain $0 \le \theta \le 2\pi$, the equation $2\cos^2\theta = \cos\theta$ has solutions of:

A. $\theta = \frac{\pi}{3}, \frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{3}$ **C.** $\theta = \frac{2\pi}{3}, \frac{4\pi}{3}$

B. $\theta = \frac{\pi}{3}, \frac{5\pi}{3}$ **D.** $\theta = 0, \pi, 2\pi$

11. Over the domain $0 \le \theta \le 2\pi$, the equation $\tan^4\theta - \tan^2\theta = 0$ has solutions of:

A. $\theta = \frac{\pi}{2}, \frac{3\pi}{2}$ **C.** $\theta = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

B. $\theta = 0, \pi, 2\pi$ **D.** $\theta = 0, \frac{\pi}{4}, \frac{3\pi}{4}, \pi, \frac{5\pi}{4}, \frac{7\pi}{4}, 2\pi$

12. Over the domain $0 \le \theta \le 2\pi$, the equation $2\sin^2\theta - \sin\theta - 1 = 0$ has solutions of:

A. $\theta = 0, \pi, 2\pi$ **C.** $\theta = \frac{\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}$

B. $\theta = \frac{\pi}{6}, \frac{5\pi}{6}$ **D.** $\theta = \frac{\pi}{4}, \frac{5\pi}{4}, \frac{4\pi}{3}, \frac{5\pi}{3}$

13. Over the domain $0 \le \theta \le 2\pi$, the equation $\csc^2\theta - 3\csc\theta + 2 = 0$ has solutions of:

A. $\theta = \pi$ **C.** $\theta = \frac{\pi}{3}, \frac{2\pi}{3}$

B. $\theta = \frac{\pi}{6}, \frac{\pi}{2}, \frac{5\pi}{6}$ **D.** $\theta = 0, \frac{\pi}{4}, \frac{\pi}{2}, \frac{3\pi}{4}, \pi$

14. Over the domain $0 \le \theta \le 2\pi$, the equation $2\sin^3\theta - 5\sin^2\theta + 2\sin\theta = 0$ has solutions of:

A. $\theta = \frac{\pi}{6}, \frac{5\pi}{6}$ **C.** $\theta = 0, \frac{\pi}{6}, \frac{5\pi}{6}, \pi, 2\pi$

B. $\theta = 0, \pi, 2\pi$ **D.** $\theta = \frac{\pi}{6}, \frac{\pi}{2}, \frac{5\pi}{6}, \frac{3\pi}{2}$

19. Which trigonometric equation can be classified as a trigonometric identity?

A. $\sin x = -\frac{1}{2}$

B. $\tan x = 1$

C. $\csc x = \frac{1}{\sin x}$

D. $\sec x = \text{undefined}$

20. The expression $\cot x \sin x \sec x$ is equivalent to:

A. 1, with no domain restrictions.

B. 1, with the domain restriction $x \neq \frac{n\pi}{2}$.

C. $\sin x$, with no domain restrictions.

D. $\cos x$, with the domain restriction $x \neq n\pi$.

21. The expression $\frac{\sin x \sec x}{\cot x}$ is equivalent to:

A. 1, with no domain restrictions.

B. $\tan x$, with the domain restriction $x \neq \frac{n\pi}{2}$.

C. $\tan^2 x$, with the domain restriction $x \neq \frac{n\pi}{2}$.

D. $\tan^2 x$, with the domain restriction $x \neq n\pi$.

22. The expression $\cos x - \cos^3 x$ is equivalent to:

A. $\sin^3 x$, with no domain restrictions.

B. $\cos^2 x$, with no domain restrictions.

C. $\cos x \sin^2 x$, with no domain restrictions.

D. $\cos^2 x \sin^2 x$, with no domain restrictions.

23. The expression $\frac{\sec^2 x - 1}{1 + \tan^2 x}$ is equivalent to:

A. $\sin x$, with no domain restrictions.

B. $\sin^2 x$, with the domain restriction $x \neq n\pi$.

C. $\sin^2 x$, with the domain restriction $x \neq \frac{n\pi}{2}$.

D. $\sin^2 x$, with the domain restriction $x \neq \frac{\pi}{2} + n\pi$.

24. The expression $\frac{\sin^2 x}{1 - \cos x}$ is equivalent to:

A. $1 + \cos x$, with the domain restriction $x \neq n(2\pi)$.

B. $1 + \cos x$, with the domain restriction $x \neq \frac{\pi}{2} + n\pi$.

C. $1 - \cos x$, with the domain restriction $x \neq n(2\pi)$.

D. $1 - \cos x$, with the domain restriction $x \neq \frac{\pi}{2} + n\pi$.

25. The expression $1 + \sec x$ is equivalent to:

A. $\frac{\cos x + 1}{\cos x}$, with the domain restriction $x \neq \frac{\pi}{2} + n\pi$.

B. $\frac{\cos x + 1}{\cos x}$, with the domain restriction $x \neq \frac{n\pi}{2}$.

C. $\frac{\sin x + 1}{\sin x}$, with the domain restriction $x \neq \frac{\pi}{2} + n\pi$.

D. $\frac{\sin x + 1}{\sin x}$, with the domain restriction $x \neq \frac{n\pi}{2}$.

26. The expression $\cot x + \tan x$ is equivalent to:

A. $\sec x \csc x$, with the domain restriction $x \neq \frac{\pi}{2} + n\pi$.

B. $\sec x \csc x$, with the domain restriction $x \neq \frac{n\pi}{2}$.

C. $\cos x \sin x$, with the domain restriction $x \neq \frac{\pi}{2} + n\pi$.

D. $\cos x \sin x$, with the domain restriction $x \neq \frac{n\pi}{2}$.

27. The expression $\frac{\cos x}{1+\sin x}+\frac{\cos x}{1-\sin x}$ is equivalent to:

A. $2\cos x$, with the domain restriction $x \neq \frac{\pi}{2}+n\pi$.

B. $2\sin x$, with the domain restriction $x \neq \frac{\pi}{2}+n\pi$.

C. $2\sec x$, with the domain restriction $x \neq \frac{\pi}{2}+n\pi$.

D. $2\csc x$, with the domain restriction $x \neq \frac{\pi}{2}+n\pi$.

28. The expression $\frac{\cos x}{1-\sin x}$ is equivalent to:

A. $\frac{1+\sin x}{\cos x}$, with the domain restriction $x \neq \frac{\pi}{2}+n\pi$.

B. $\frac{1+\sin x}{\cos x}$, with the domain restriction $x \neq n\pi$.

C. $\frac{1-\sin x}{\cos x}$, with the domain restriction $x \neq \frac{\pi}{2}+n\pi$.

D. $\frac{1-\sin x}{\cos x}$, with the domain restriction $x \neq n\pi$.

29. The expression $\sin^4 x-\cos^4 x$ is equivalent to:

A. $2\sin^2 x - 1$, with no domain restrictions.

B. $1 - 2\sin^2 x$, with no domain restrictions.

C. $2\cos^2 x - 1$, with no domain restrictions.

D. $1 - 2\cos^2 x$, with no domain restrictions.

30. The expression $\frac{1}{5}\sin^2 x+\frac{1}{5}\cos^2 x$ is equivalent to:

A. $\frac{1}{25}$, with no domain restrictions.

B. $\frac{1}{5}$, with no domain restrictions.

C. $\frac{2}{5}$, with no domain restrictions.

D. 5, with no domain restrictions.

31. The **false** statement regarding $\sin x = \tan x \cos x$ is:

A. The left side and right side are equal algebraically.

B. The left side and right side are equal when $x = \frac{\pi}{3}$.

C. The left side and right side have the same non-permissible values.

D. The graph of y = sin*x* is continuous but the graph of y = tan*x*cos*x* has holes.

32. Over the domain $0 \le \theta \le 2\pi$, the equation $2\sin^2 x - \cos x - 1 = 0$ has solutions of:

A. $x = \frac{\pi}{6}, \frac{5\pi}{6}$

B. $x = \frac{\pi}{3}, \pi, \frac{5\pi}{3}$

C. $x = \frac{\pi}{3}, \frac{\pi}{2}, \frac{2\pi}{3}$

D. $x = \frac{4\pi}{3}, \pi, \frac{5\pi}{3}$

33. Over the domain $0 \le \theta \le 2\pi$, the equation $3 - 3\csc x + \cot^2 x = 0$ has solutions of:

A. $x = \frac{\pi}{6}, \frac{\pi}{2}, \frac{5\pi}{6}$

B. $x = \frac{7\pi}{6}, \frac{3\pi}{2}, \frac{11\pi}{6}$

C. $x = \frac{\pi}{3}, \frac{\pi}{2}, \frac{5\pi}{3}$

D. $x = \frac{4\pi}{3}, \frac{3\pi}{2}, \frac{5\pi}{3}$

34. Over the domain $0 \le \theta \le 2\pi$, the equation $2\sec^2 x - \tan^4 x = -1$ has solutions of:

A. $x = \frac{4\pi}{3}, \frac{5\pi}{3}$

B. $x = \frac{7\pi}{6}, \frac{11\pi}{6}$

C. $x = \frac{\pi}{6}, \frac{\pi}{3}, \frac{2\pi}{3}, \frac{5\pi}{6}$

D. $x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

35. If the value of $\sin x = \frac{4}{7}, 0 \le x \le \frac{\pi}{2}$, the value of cos*x* within the same domain is:

A. $\cos x = -\frac{1}{2}$

B. $\cos x = -\frac{4}{7}$

C. $\cos x = \frac{7}{4}$

D. $\cos x = \frac{\sqrt{33}}{7}$

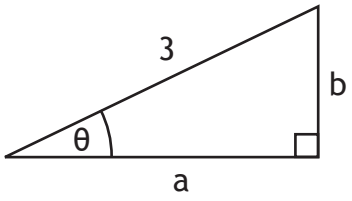
36. Using the triangle to the right, the expression $\frac{\sqrt{9 - b^2}}{b^2}$ can be rewritten as:

A. $\frac{\cos\theta}{3\sin^2\theta}$

B. $\frac{\sin\theta}{3\cos^2\theta}$

C. $\frac{3\cos^2\theta}{\sin\theta}$

D. $\frac{3\sin^2\theta}{\cos\theta}$



b = 3sinθ

37. The exact value of $\sin\left(\frac{\pi}{2} - \frac{\pi}{6}\right)$ is:

A. $\frac{1}{2}$

B. $\frac{\sqrt{3}}{2}$

C. $\frac{1+\sqrt{3}}{2}$

D. $\frac{1-\sqrt{3}}{2}$

38. A trigonometric expression equivalent to $\dfrac{\tan\frac{\pi}{4} - \tan\frac{\pi}{6}}{1 + \tan\frac{\pi}{4}\tan\frac{\pi}{6}}$ is:

A. $\tan\left(\dfrac{\pi}{12}\right)$

B. $\tan\left(\dfrac{\pi}{6}\right)$

C. $\tan\left(\dfrac{\pi}{3}\right)$

D. $\tan\left(-\dfrac{\pi}{3}\right)$

39. The exact value of $\sin\left(\dfrac{5\pi}{12}\right)$ is:

A. $\dfrac{\sqrt{6}+\sqrt{2}}{4}$

B. $\dfrac{\sqrt{6}-\sqrt{2}}{4}$

C. $\dfrac{\sqrt{6}}{2}$

D. $\sqrt{3}$

40. $\sin x$ is equivalent to the expression:

A. $1-2\sin^2\left(\dfrac{1}{4}x\right)$

B. $\cos^2 x - \sin^2 x$

C. $2\sin\left(\dfrac{1}{2}x\right)\cos\left(\dfrac{1}{2}x\right)$

D. $-\cos x$

41. The expression $\cos 2x + 2\sin^2 x$ is equivalent to:

A. 1

B. $\sin x$

C. $\cos^2 x$

D. $\frac{1}{2}\tan 2x$

42. The expression $\cos^4 x - \sin^4 x$ is equivalent to:

A. $\sin^2 x$

B. $\cos^2 x$

C. $\cos 2x$

D. $\sin 2x$

43. The expression $\sin 3x$ is equivalent to:

A. $\sin^2(2x)$

B. $\sin(2x)\cos x$

C. $\sin(2x)\sin x$

D. $3\sin x - 4\sin^3 x$

44. The expression $\cos 34^\circ \cos 41^\circ - \sin 34^\circ \sin 41^\circ$ is equivalent to:

A. $\frac{\sqrt{6}-\sqrt{2}}{4}$

B. $\frac{\sqrt{6}+\sqrt{2}}{4}$

C. $\sqrt{2}$

D. $\sqrt{3}$

45. Over the domain $0 \le \theta \le 2\pi$, the equation $\cos 2x = \cos^2 x$ has solutions of:

A. $x = \frac{\pi}{6}, \frac{5\pi}{6}$

B. $x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

C. $x = \frac{\pi}{2}, \frac{3\pi}{2}$

D. $x = 0, \pi, 2\pi$

46. Over the domain $0 \le \theta \le 2\pi$, the equation $\sin x \cos x = \frac{1}{4}$ has solutions of:

A. $x = \frac{\pi}{12}, \frac{5\pi}{12}$

B. $x = \frac{\pi}{12}, \frac{5\pi}{12}, \frac{13\pi}{12}, \frac{17\pi}{12}$

C. $x = \frac{\pi}{2}, \frac{3\pi}{2}$

D. $x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

47. Over the domain $0 \le \theta \le 2\pi$, the equation $\cos 2x - \cos x = 0$ has solutions of:

A. $x = 0, \frac{2\pi}{3}, \frac{4\pi}{3}, 2\pi$

B. $x = 0, \frac{4\pi}{3}, \frac{5\pi}{3}, 2\pi$

C. $x = \frac{\pi}{2}, \frac{3\pi}{4}, \frac{5\pi}{4}$

D. $x = \frac{\pi}{4}, \frac{\pi}{2}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{3\pi}{2}, \frac{7\pi}{4}$

48. Over the domain $0 \le \theta \le 2\pi$, the equation $\cos(x + \pi) - \cos^2 x = 0$ has solutions of:

A. $x = 0, \pi, 2\pi$

B. $x = \frac{\pi}{4}, \frac{\pi}{2}, \frac{3\pi}{4}$

C. $x = \frac{\pi}{2}, \pi, \frac{3\pi}{2}$

D. $x = \frac{5\pi}{4}$

Trigonometry Two Practice Exam - ANSWER KEY

1. **D** *Trigonometric Equations, Example 1c*
2. **D** *Trigonometric Equations, Example 2d*
3. **B** *Trigonometric Equations, Example 3b*
4. **B** *Trigonometric Equations, Example 4b*
5. **B** *Trigonometric Equations, Example 6*
6. **C** *Trigonometric Equations, Example 7a*
7. **C** *Trigonometric Equations, Example 8b*
8. **A** *Trigonometric Equations, Example 12*
9. **C** *Trigonometric Equations, Example 14a*
10. **A** *Trigonometric Equations, Example 15c*
11. **D** *Trigonometric Equations, Example 15d*
12. **C** *Trigonometric Equations, Example 16a*
13. **B** *Trigonometric Equations, Example 16b*
14. **C** *Trigonometric Equations, Example 16c*
15. **C** *Trigonometric Equations, Example 17a*
18. **B** *Trigonometric Equations, Example 20*
19. **C** *Trigonometric Identities I, Example 1b*
20. **B** *Trigonometric Identities I, Example 3b*
21. **C** *Trigonometric Identities I, Example 4a*
22. **C** *Trigonometric Identities I, Example 5b*
23. **D** *Trigonometric Identities I, Example 6b*
24. **A** *Trigonometric Identities I, Example 6c*
25. **A** *Trigonometric Identities I, Example 7a*
26. **B** *Trigonometric Identities I, Example 7c*
27. **C** *Trigonometric Identities I, Example 8c*
28. **A** *Trigonometric Identities I, Example 8d*
29. **A** *Trigonometric Identities I, Example 9b*
30. **B** *Trigonometric Identities I, Example 10c*
31. **C** *Trigonometric Identities I, Example 12*
32. **B** *Trigonometric Identities I, Example 15a*
33. **A** *Trigonometric Identities I, Example 16a*
34. **D** *Trigonometric Identities I, Example 17a*
35. **D** *Trigonometric Identities I, Example 18a*
36. **A** *Trigonometric Identities I, Example 19a*
37. **B** *Trigonometric Identities II, Example 1b*
38. **A** *Trigonometric Identities II, Example 2b*
39. **A** *Trigonometric Identities II, Example 3b*
40. **C** *Trigonometric Identities II, Example 6b (iii)*
41. **A** *Trigonometric Identities II, Example 9a*
42. **C** *Trigonometric Identities II, Example 10a*
43. **D** *Trigonometric Identities II, Example 12d*
44. **A** *Trigonometric Identities II, Example 13c*
45. **D** *Trigonometric Identities II, Example 14a*
46. **B** *Trigonometric Identities II, Example 15d*
47. **A** *Trigonometric Identities II, Example 16a*
48. **C** *Trigonometric Identities II, Example 17d*
49. **C** *Trigonometric Identities II, Example 20a*
50. **D** *Trigonometric Identities II, Example 21 (b, c)*