Solutions to Trigonometry Problems

Civil Engineering Licensure Exam – Mock Exam (Day 3)

February 25, 2025

Solutions

1. Simplify $\sin^2 x + \cos^2 x$.

   Solution: Trigonometry For Beginners!

2. Solve for x in the equation $\cos x = \frac{1}{2}$ for $0° \leq x \leq 360°$.

   Solution: Solving Trigonometric Equations By Finding All Solutions

3. Which of the following is an identity?

   Solution: Verifying Trigonometric Identities

4. Given a right triangle where θ is an acute angle and $\tan \theta = \frac{3}{4}$, what is $\sin \theta$?

   Solution: Intro to Trigonometric Identities

5. Using the Law of Sines, solve for $\angle B$ in a triangle where $a = 8$, $b = 10$, and $\angle A = 40°$.

   Solution: Trigonometry Word Problems (Part 1)

6. Prove the identity:
$$\frac{1 - \cos 2x}{\sin 2x} = \tan x$$

   Solution: Trigonometric Identity Proofs

7. Solve for x in:
$$2 \sin x - 1 = 0, \quad 0° \leq x \leq 360°$$

   Solution: Solving Simple Trig Equations

8. Given $\cos A = 0.6$, find $\sin 2A$.

   Solution: Double Angle Identities & Formulas of Sin, Cos & Tan - Trigonometry

9. Solve the triangle using the Law of Cosines where:

$$a = 7, \quad b = 9, \quad c = 12$$

Solution: Law of Cosines, Finding Angles & Sides, SSS & SAS Triangles

10. A tower casts a shadow of 20 meters when the angle of elevation of the sun is $30°$. Find the height of the tower.

Solution: Angles of Elevation & Depression — Trigonometry — Maths — FuseSchool