

Unit 7 Test

Pythagorean, Sum/Difference, Double-Angle Identities & Solving Equations

Name: _____ Date: _____ Score: ____ / 10

INSTRUCTIONS

For multiple-choice questions, circle the letter of the correct answer. For short-answer and problem-solving questions, show your complete work in the space provided. No calculator unless your teacher says otherwise.

1 Simplify: $\sin(x)/\cos(x)$

Multiple Choice

A $\tan(x)$ **B** $\cot(x)$ **C** $\sec(x)$ **D** $\csc(x)$ **2 What is $\sin^2(x) + \cos^2(x)$ equal to?**

Multiple Choice

A 1**B** 0**C** $\tan^2(x)$ **D** $\sec^2(x)$ **3 Short Answer — Simplify: $(1 - \cos^2(x)) / \sin(x)$**

Short Answer

4 Use a sum formula to find the exact value of $\sin(75^\circ)$.

Multiple Choice

A $(\sqrt{6} + \sqrt{2})/4$ **B** $(\sqrt{6} - \sqrt{2})/4$ **C** $\sqrt{3}/2$ **D** $\sqrt{2}/2$ **5 Which expression is equivalent to $\cos(2x)$?**

Multiple Choice

A $1 - 2\sin^2(x)$ **B** $2\sin(x)\cos(x)$ **C** $1 - \cos^2(x)$ **D** $\sin^2(x) - \cos^2(x)$ **6 Short Answer — If $\sin(x) = 3/5$ and $\cos(x) = 4/5$ with x in Quadrant I, find $\sin(2x)$.**

Short Answer

7 Solve $2\sin(x) - 1 = 0$ for x in $[0, 2\pi)$.

Multiple Choice

A $\{\pi/6, 5\pi/6\}$ **B** $\{\pi/3, 2\pi/3\}$ **C** $\{\pi/6, 7\pi/6\}$ **D** $\{\pi/4, 3\pi/4\}$

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8 Solve $\cos(2x) = 0$ for x in $[0, \pi)$.

Multiple Choice

A $\{\pi/4, 3\pi/4\}$ **B** $\{\pi/2\}$ **C** $\{\pi/6, 5\pi/6\}$ **D** $\{\pi/3, 2\pi/3\}$ **9** **Problem Solving** — Verify the identity $(1 + \cos(x))/\sin(x) = \sin(x)/(1 - \cos(x))$ by cross-multiplying and using a Pythagorean identity. Show all steps.

Problem Solving

10**Problem Solving** — Solve $\sin(2x) = \sin(x)$ for x in $[0, 2\pi)$. Show all steps.

Problem Solving