

AP Precalculus
Angle Sum, Difference, and Double-Angle Identities

Angle Sum, Difference, and Double-Angle Identities | APPC-U03-P22

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
02	Grid Rounds	24 tasks
03	Match & Move	24 cards
04	Error Analysis & Strategy	24 tasks
05	Quick Answer Key	96 answers
06	Full Worked Solutions	96 solutions
07	Teacher / Parent Use Guide	included
08	Terms of Use & License	included

Topic focus

Across 96 tasks this topic asks for $\cos(\alpha-\beta)$, $\cos 2x$, equivalent expression, rewrite and range, exact value and rewrite and maximum.

8 PDFs and a README; 75 buyer pages.

AP Precalculus

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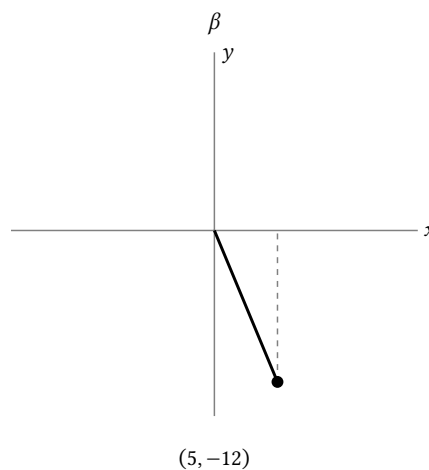
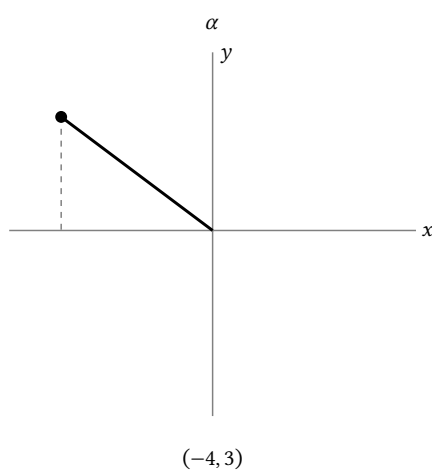
Name: _____ Date: _____ Class: _____

Answer each question and record the matching bank letter. Give exact values. Give the whole requested response, including any reasoning the question asks for.

Use a difference identity to obtain the exact value of $\cos 15^\circ$.

Bank label: _____

Angle α lies in quadrant II with $\tan \alpha = -\frac{3}{4}$, and β lies in quadrant IV with $\sec \beta = \frac{13}{5}$. Find $\sin(\alpha - \beta)$.



Bank label: _____

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Name: _____ Date: _____ Class: _____

Begin at START. Answer the card, then find the matching final answer at the top of another card. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

START

Evaluate $\sin 75^\circ$ exactly by decomposing the angle into familiar angles.

Your response: _____

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Evaluate the supplied statement or method. Say whether it is correct, repair it if it is not, and verify the result exactly. Not every prompt contains an error.

A short route cancels $\cos x$ and announces an identity for all real x . A second route checks domains first. Decide which conclusion is valid and repair the quantifier.

Evaluate the claim $\frac{\sin 2x}{2 \cos x} = \sin x$ for all real x .

Work on the domain real x .

The route A is cancel $\cos x$.

The route B is compare original domains first.

The output is corrected claim.

A student writes $\cos 2x = 2 \cos x - 1$. Repair the rule and give one input that reveals the missing square.

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Full Worked Solutions - excerpt

Worked example

Problem. Transform $\sin 2x - 2 \cos x$ into a product that displays its two zero-producing factors. Do not find the roots.

Answer. $2 \cos x(\sin x - 1)$

Explanation and check.

Substitute $2 \sin x \cos x$ for $\sin 2x$ and factor the common $2 \cos x$.

Worked example

Problem. Rewrite $2 \cos^2 x = 1 + \sin x$ as a polynomial equation in $\sin x$, without solving for x .

Answer. $2 \sin^2 x + \sin x - 1 = 0$

Explanation and check.

Substitute $\cos^2 x = 1 - \sin^2 x$ and collect: $2 - 2 \sin^2 x = 1 + \sin x$, so $2 \sin^2 x + \sin x - 1 = 0$.