

Precalculus
**Pythagorean, Sum & Double-Angle Identities | 2-Topic
Precalculus Bundle**

2-topic bundle | 192 problems | Four activity formats

01 Reciprocal, Quotient, and Pythagorean Trig Identities

[View individual product and its full preview](#)

02 Angle Sum, Difference, and Double-Angle Identities

[View individual product and its full preview](#)

In every topic

Answer Bank Challenge	24 tasks
Grid Rounds	24 tasks
Match & Move	24 cards
Error Analysis & Strategy	24 tasks
Quick Answer Key and Full Worked Solutions	included
Teacher / Parent Use Guide and Terms of Use	included

Product previews

The following preview pages show the cover, all four activity formats, and worked examples for each included resource, in the listed order.

16 PDFs and 2 READMEs; 137 buyer PDF pages across the 2 products.

Preview pages are not included in the buyer page count. Check the list against resources you already own.

This is a fixed collection of the listed products. Purchase includes the existing individual resource files. To open a product's online preview, follow its title link and select View Preview.

Precalculus
Reciprocal, Quotient, and Pythagorean Trig Identities

Trigonometric Functions | APPC-U03-P21

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
Use reciprocal and quotient identities, derive Pythagorean forms, simplify expressions, and justify domain restrictions and sign choices.
8 PDFs and a README; 62 buyer pages.

Precalculus

Reciprocal, Quotient, and Pythagorean Trig Identities

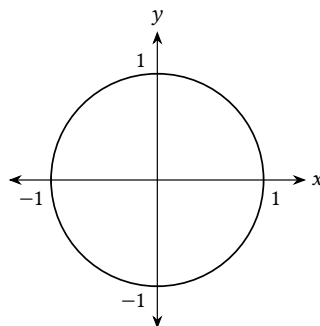
Name: _____ Date: _____ Class: _____

Answer each question and record the matching bank letter. Give exact values and the requested justification. Angles are in radians; k is an integer.

Rewrite $\sec x$ using cosine and state the inputs allowed by the original expression.

Bank label: _____

A terminal ray lies in quadrant II and $\sin^2 \theta = \frac{9}{25}$. Recover $\sin \theta$.



Bank label: _____

Use the Pythagorean identity to rewrite $1 - \sin^2 \theta$ as one squared trigonometric function.

Bank label: _____

Simplify $\frac{1}{\csc x}$, but retain the domain of the written original expression.

Bank label: _____

Precalculus

Reciprocal, Quotient, and
Pythagorean Trig Identities

Name: _____ Date: _____ Class: _____

Answer each question and show your reasoning. Use radians, exact values, and all stated domain restrictions. In excluded-input families, k is an integer.

Express $\tan x$ using sine and cosine, including its domain condition. _____ _____	The expression $\frac{\sin x}{\tan x}$ simplifies to $\cos x$. On which inputs is the simplification equal to the original, and which inputs does the simplified formula newly admit? _____ _____
Divide $\sin^2 x + \cos^2 x = 1$ by $\cos^2 x$ and name every quotient. State the required condition. _____ _____	Refute the proposed identity $\sec x = \cos x$ using an input where both sides are defined. _____ _____
Rewrite $\frac{\tan x}{\cot x}$ entirely in sine and cosine and simplify. Preserve the original restrictions. _____ _____	After replacing $1 - \cos^2 x$, the expression $\frac{1 - \cos^2 x}{\sin x}$ becomes $\sin x$. Compare the domains of the two formulas. _____ _____

Reciprocal, Quotient, and Pythagorean Trig Identities

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.

[illegible]

Precalculus

Reciprocal, Quotient, and Pythagorean Trig Identities

Name: _____ Date: _____ Class: _____

Evaluate the supplied statements or methods. Explain your decision and complete the requested task. Not every prompt contains an error.

A derivation divides $\sin^2 x + \cos^2 x = 1$ by $\sin^2 x$ “for every real x .” Repair the step and state the resulting identity.

Test the claim $1 - \cos^2 x = \sin x$. Give a counterexample and replace it with the correct identity.

Repair the step $\sqrt{\cos^2 x} = \cos x$. Give a correct all-real formula and explain when the student’s version happens to agree.

Refute $\sqrt{\sin^2 x} = \sin x$ as an all-real identity, then write the correct version.

Reciprocal, Quotient, and Pythagorean Trig Identities

Full Worked Solutions - excerpt

Worked example

Problem. Rewrite $\sec x$ using cosine and state the inputs allowed by the original expression.

Answer. $\sec x = \frac{1}{\cos x}$ for $\cos x \neq 0$

Explanation and check.

$$\sec x = \frac{1}{\cos x}$$

Cosine is defined for every real x , but the denominator must be nonzero. Therefore $\cos x \neq 0$, or equivalently $x \neq \frac{\pi}{2} + k\pi$.

Worked example

Problem. A terminal ray lies in quadrant II and $\sin^2 \theta = \frac{9}{25}$. Recover $\sin \theta$.

Answer. $\sin \theta = \frac{3}{5}$

Explanation and check.

$$\sin^2 \theta = \frac{9}{25}$$

$$\sin \theta = \pm\left(\frac{3}{5}\right)$$

Sin is positive on quadrant II. Select the matching sign.

$$\sin \theta = \frac{3}{5}$$

Check the given square: $\frac{9}{25}$; the selected sign also meets the location condition.

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
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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

Angle Sum, Difference, and Double-Angle Identities

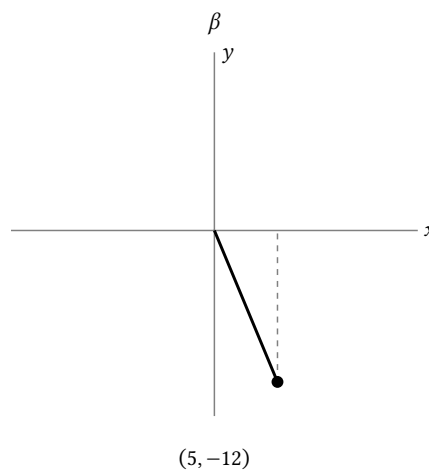
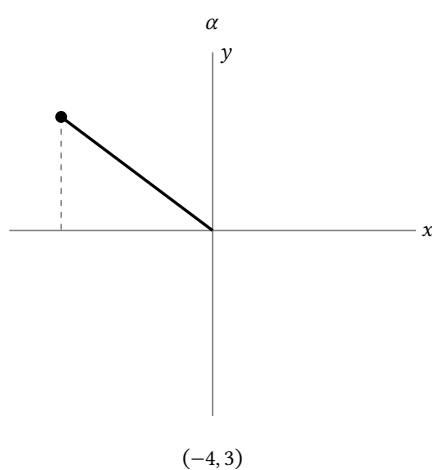
Name: _____ Date: _____ Class: _____

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: _____

AP Precalculus

**Angle Sum, Difference,
and Double-Angle Identities**

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: _____

AP Precalculus

**Angle Sum, Difference,
and Double-Angle Identities**

Name: _____ Date: _____ Class: _____

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.

Angle Sum, Difference, and Double-Angle Identities

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