

AP Precalculus
Tangent Values and Domain

Tangent Values and Domain | APPC-U03-P05

96 problems · Four activity formats

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Topic focus

Across 96 tasks this topic asks for classification and decisive evidence, exact slope and sign evidence, classification and earliest error, classification and evidence, exact ordering and earliest error and repair.

8 PDFs and a README; 146 buyer pages.

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and Domain

Name: _____ Date: _____ Class: _____

Give exact answers and all requested reasoning; record a bank letter. If bank entries give equivalent final responses for the same quantity and context, either label is valid and may be reused. A shared numerical value alone does not make entries interchangeable.

Order these exact scalar values from least to greatest, grouping ties and using no decimals: $\tan(2\frac{\pi}{3})$, $\sin(3\frac{\pi}{2})$, $\cos(5\frac{\pi}{6})$.

Solve the problem and show enough exact work for the requested result.

$$\tan(2\frac{\pi}{3})$$

$$\sin(3\frac{\pi}{2})$$

$$\cos(5\frac{\pi}{6})$$

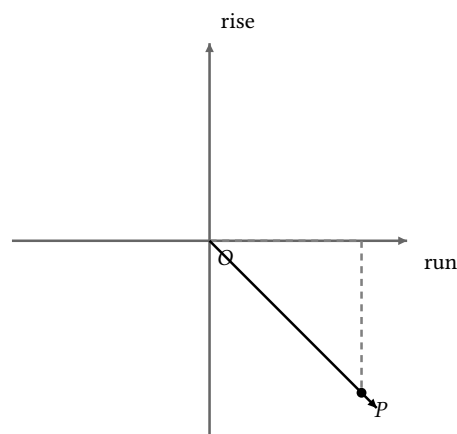
Bank label: _____

Given $\tan(\frac{\pi}{3}) = \sqrt{3}$, use “negate angle” to infer $\tan(-\frac{\pi}{3})$. Explain whether one or both coordinate signs change.

Bank label: _____

A terminal ray passes through $(-4, -4\sqrt{3})$. Evaluate its exact tangent from rise/run and explain why radius normalization is unnecessary.

A marked ray has signed run 12 and rise -12 . Calculate its exact tangent and explain which geometric datum controls the sign.



Bank label: _____

Bank label: _____

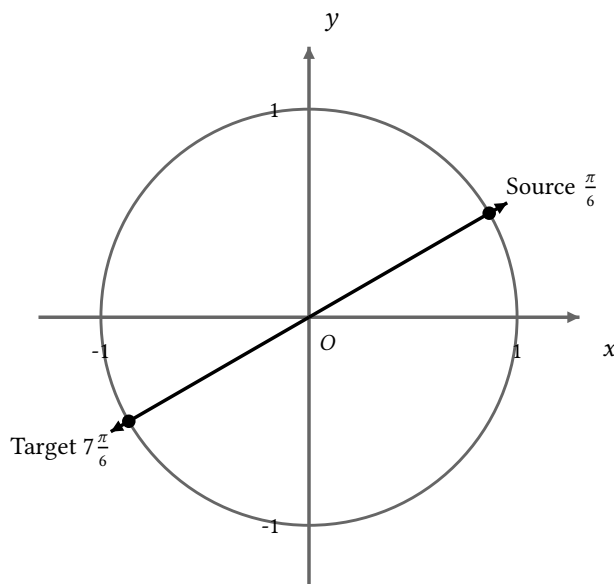
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Name: _____ Date: _____ Class: _____

Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. Give the whole requested response, including any reasoning the question asks for.

Given $\tan\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{3}$, use “add π ” to infer $\tan\left(7\frac{\pi}{6}\right)$. Explain whether one or both coordinate signs change.



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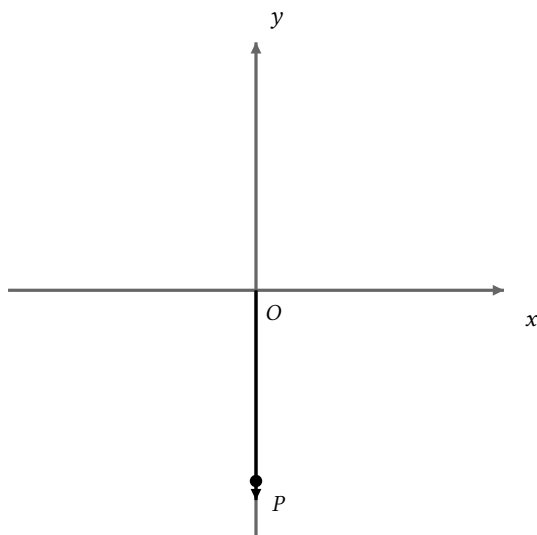
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Begin at START. Answer the card, then find the matching final answer at the top of another card. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

Incoming: $\tan(-5\frac{\pi}{6}) = \frac{\sqrt{3}}{3}$

A ray is represented by the exact point $(0, -3)$. Classify its tangent as zero, nonzero, or undefined and cite numerator and denominator roles.



zero

nonzero

undefined

Your response: _____

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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.

Audit the claim “ $\tan(\pi)$ is undefined because sine is zero.” Classify tangent correctly and identify the first quotient or domain error.

Identify the error or first invalid step, give the corrected result, and state a brief mathematical reason.

denominator
permission
sign

A student claims: “Because the x -coordinate contains a radical, only a decimal estimate is possible.” Diagnose the first invalid step or assumption, give the corrected conclusion, and justify the correction. Then complete the stated task: Evidence case: an exact point $(2\sqrt{3}, 2)$. Decide whether it determines an exact tangent, only an estimate, or no domain conclusion. State the decisive evidence and any exact datum still needed.

Identify the error or first invalid step, give the corrected result, and state a brief mathematical reason.

Value status	x	y
exact	$2\sqrt{3}$	2

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Full Worked Solutions - excerpt

Worked example

Problem. At $\theta = \pi$, $(\sin \theta, \cos \theta) = (0, -1)$. Evaluate $\tan \theta$ as a signed coordinate quotient and simplify exactly.

Answer. $\tan(\pi) = 0$

Explanation and check.

Cosine -1 is the denominator. The quotient $\frac{0}{-1}$ simplifies to 0 .

Worked example

Problem. Given $\tan(3\frac{\pi}{4}) = -1$, use “add π ” to infer $\tan(7\frac{\pi}{4})$. Explain whether one or both coordinate signs change.

Answer. $\tan(7\frac{\pi}{4}) = -1$

Explanation and check.

Adding π takes the opposite ray, so both x and y change sign. The quotient $\frac{y}{x}$ is unchanged, giving $\tan(7\frac{\pi}{4}) = -1$.