

AP Precalculus
Solving Trigonometric Equations

Solving Trigonometric Equations | APPC-U03-P17

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 count by h-region, count by level case, count for each L, number of distinct solutions for each case, solution count by case and all roots.

8 PDFs and a README; 47 buyer pages.

AP Precalculus

Solving Trigonometric Equations

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.

Solve $\sin x = \frac{1}{2}$ for $0 \leq x \leq 2\pi$. Use both unit-circle branches and check the endpoints. _____ Bank label: _____	Solve $\sin(2x) = 0$ on $0 \leq x \leq \pi$. First map the x-interval to the complete $2x$-interval, then divide the enumerated angle values by 2. _____ Bank label: _____
Solve $2 \sin^2 x - 3 \sin x + 1 = 0$ for $0 \leq x \leq 2\pi$. Treat $u = \sin x$, solve both feasible levels, and merge any overlapping angle sets. _____ Bank label: _____	Find every x in $[0, 2\pi)$ satisfying $\sin x \cos x = 0$. Solve the two zero factors separately and combine without duplicating any root. _____ Bank label: _____
Solve $\frac{\sin x}{1 - \cos x} = 0$ on $[0, 2\pi]$. Record denominator exclusions before using numerator-zero logic. _____ Bank label: _____	Using $\sin^2 x = 1 - \cos^2 x$, solve $\sin^2 x = 1 - \cos x$ on $[0, 2\pi)$. Keep every root produced by the resulting factored equation. _____ Bank label: _____
Solve $\cos x = -\frac{\sqrt{2}}{2}$ for $-\pi \leq x < \pi$. Use the signed unit-circle interval rather than converting the final answers to $[0, 2\pi)$. _____ Bank label: _____	Solve $\cos(x - \frac{\pi}{3}) = \frac{1}{2}$ on $[0, 2\pi]$. Enumerate every allowed angle $x - \frac{\pi}{3}$ in the mapped window, including boundary hits. _____ Bank label: _____

AP Precalculus

Solving Trigonometric Equations

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 student reports only $x = \frac{\pi}{3}$ for $\sin x = \frac{\sqrt{3}}{2}$ on $[0, 2\pi]$. Identify the missing branch and give the corrected complete set.

A student uses $a2\pi$ repeat and lists $\{-2\pi, 0, 2\pi\}$ for $\tan x = 0$ on $[-2\pi, 2\pi]$. Repair the period and include every missing root.

A solution lists both 0 and 2π for $\cos x = 1$ on $[0, 2\pi)$. Repair the set by applying the interval notation.

A solution factors $\sin^2 x + \sin x - 2 = 0$ but tries to include an angle for $\sin x = -2$. Remove the impossible auxiliary level and finish the solution on $[0, 2\pi]$.

Solving Trigonometric Equations

Full Worked Solutions - excerpt

Worked example

Problem. Solve $\cos x = -1$ on $-2\pi \leq x \leq 2\pi$. Filter the extreme-value family $\pi + 2k\pi$ through the symmetric interval.

Answer. $\{-\pi, \pi\}$

Explanation and check.

The family $x = \pi + 2k\pi$ yields $-\pi$ for $k = -1$ and π for $k = 0$. Adjacent values lie outside the interval.

Worked example

Problem. Solve $5 \tan x + 2 = 2$ on $[-\pi, \pi]$. Apply tangent's π -spaced zero family to the closed endpoints.

Answer. $\{-\pi, 0, \pi\}$

Explanation and check.

The equation reduces to $\tan x = 0$, whose zeros $x = k\pi$ in the interval are $-\pi, 0, \pi$.