

AP Precalculus

Parametric Tables and Curve Tracing

Parametric Tables and Curve Tracing | APPC-U04-P01

96 problems · Four activity formats

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Topic focus

Across 96 tasks this topic asks for equal x and equal y input pairs, filled table, repeated point, equal-y pair, (t,x,y) table, ordered triples, anchor order and repeated-point times and vertex order and closure.

8 PDFs and a README; 157 buyer pages.

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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.

Connect consecutive table points by straight segments for increasing t . List the vertex order and decide whether the path closes.

Required response

t	x	y
0	1	0
1	0	2
2	-1	0
3	0	-2
4	1	0

For $x = t^2 - 1$, $y = t^2$ on $-2 \leq t \leq 2$, find every t that visits $(0, 1)$. What causes the repeat?

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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.

START

A trace labels $t = 0$ at $(-2, 1)$, $t = 2$ at $(3, 4)$, and $t = 5$ again at $(-2, 1)$. Write the component rows and identify the repeated visit.

Supplied labeled points

Given points only; connections between labels are unspecified here.

A: $t = 0(-2, 1)$
B: $t = 2(3, 4)$
A: $t = 5(-2, 1)$

Your response: _____

Incoming: The sequence is $(0, 0) \rightarrow (2, 1) \rightarrow (0, 0) \rightarrow (-1, 2)$. The origin is visited at $t = 0$ and $t = 2$.
Build the paired table for $x = t + 1$ and $y = 2t$ at $t = -2, 0, 3$.

Your response: _____

Incoming: Rows are $(0, -2, 1), (2, 3, 4), (5, -2, 1)$. The point $(-2, 1)$ is visited at both $t = 0$ and $t = 5$.
Connect consecutive samples in increasing t . Give the point sequence and identify any repeated location.

Required response

t	x	y
0	0	0
1	2	1
2	0	0
3	-1	2

Your response: _____

Incoming: $[[-2, -1, -4], [0, 1, 0], [3, 4, 6]]$
Determine the joint domain, identify the two denominator holes, and evaluate each attained outer boundary point. Work with $-5 \leq t \leq 5$. Restrict the parameter to $[-5, 5]$. Use $x = \sqrt{((t+1)(t-4))}/(t-5)$. Use $y = \ln(6-t)/(t+3)$.

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.

For $x = t^2$ and $y = 2t - 1$, a student writes rows $(0, 0, 1), (1, 1, 3), (2, 4, -1)$. Identify the pairing error and give the correct table.

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

t	x	y
0	0	1
1	1	3
2	4	-1

A student claims: “At $t = 0$ record $y = 0$, so all four requested rows are valid.” Diagnose the first invalid step or assumption, give the corrected conclusion, and justify the correction. Then complete or verify the underlying task: Build the paired table for $x = t^2 - 3t, y = \frac{4}{t}$ at $t = -2, 0, 2, 4$, marking invalid inputs.

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Full Worked Solutions - excerpt

Worked example

Problem. Build the (t, x, y) table for $x = |t| - 1$, $y = t^2 - 4$ at $t = -2, -1, 1, 3$. Identify any repeated plane point.

Answer. Rows are $(-2, 1, 0), (-1, 0, -3), (1, 0, -3), (3, 2, 5)$. The point $(0, -3)$ repeats at $t = -1$ and $t = 1$.

Explanation and check.

Both components are even in t on the paired ± 1 inputs, so those two rows have the same x and y outputs.

Worked example

Problem. For $x = (t - 1)(t + 1)$, $y = (t - 2)(t + 1)$, find all visits to $(0, 0)$ on $-2 \leq t \leq 3$.

Answer. Only $t = -1$ visits $(0, 0)$.

Explanation and check.

$x = 0$ at $t = -1$ or 1 , while $y = 0$ at $t = -1$ or 2 . The only common root is -1 .