Sets & Steps
Math Practice & Worked Solutions

AP Precalculus

Conic Sections from Equations and Data

Conic Sections from Equations and Data | APPC-U04-P08

96 problems · Four activity formats

Topic focus

Across 96 tasks this topic asks for axis, direction, x-intercepts, vertex, axis, direction, sample point, exact points, normalized form, equation or contradiction and equation or impossibility.

8 PDFs and a README; 158 buyer pages.

The following pages use the same questions, given data, and notation as the final files. Question/card serial numbers and internal IDs are omitted in this preview only. Table values and matching responses are retained. Full answer keys are not included.

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AP Precalculus

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Name: _____ **Date:** _____ **Class:** _____

Answer each question and record the matching bank letter. Give exact values. A value without its unit is not a complete answer.

Use the two labeled rows to determine the vertex-form coefficient.

Required response

role	x	y
vertex	1	−2
curve point	3	6

Bank label: _____

Normalize the equation and determine whether any real point remains. domain: x, y real; equation: $x^2 + y^2 - 4x + 2y + 9 = 0$.

Bank label: _____

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Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. A value without its unit is not a complete answer.

List the graph-defining features of the hyperbola. domain: x, y real; equation: $\frac{x^2}{9} - \frac{y^2}{16} = 1$.

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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

Complete both squares and normalize the constant to 1. domain: x, y real; equation: $4x^2 + 9y^2 - 16x + 18y - 11 = 0$.

Your response: _____

Incoming: $\frac{(x-2)^2}{9} + \frac{(y+1)^2}{4} = 1$.

Use the labeled extreme-point table to construct the ellipse.

Required response

label	x	y
right	6	0
left	-6	0
top	0	2
bottom	0	-2

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.

Find the constant error in the work and repair the conic description. domain: x, y real; equation: $4x^2 - 16x + y^2 + 6y - 11 = 0$; student work: $4(x-2)^2 + (y+3)^2 = 20$. Identify the error or first invalid step, give the corrected result, and state a brief mathematical reason.

A student claims: “The focus $(0, 2)$ gives $p = 1$, so the equation is $x^2 = 4y$ and $(4, 2)$ is not on the parabola.” Diagnose the first invalid step or assumption, give the corrected conclusion, and justify the correction. Then complete or verify the underlying task: Build the focal equation and test the proposed point. candidate point: $4, 2$; domain: vertical parabola; focus: $0, 2$; rule: $x^2 = 4py$; student claim: The focus $(0, 2)$ gives $p = 1$, so the equation is $x^2 = 4y$ and $(4, 2)$ is not on the parabola.; vertex: $0, 0$. Identify the stated incorrect claim or first invalid step, give the corrected result, and state a brief mathematical reason.

Conic Sections from Equations and Data

Full Worked Solutions - excerpt

Worked example

Problem. State the two defining geometric features. domain: x, y real; equation: $x^2 + y^2 = 81$.

Answer. Center $(0, 0)$, radius 9.

Explanation and check.

The equation is a sum of squared displacements equal to 9^2.

Worked example

Problem. Write the exact equation without converting the radius to a decimal. center: $-3, 1$; domain: circle; radius: $\sqrt{11}$.

Answer. $(x + 3)^2 + (y - 1)^2 = 11$.

Explanation and check.

Coordinate differences measure displacement from $(-3, 1)$, and the equation uses radius squared.