

Precalculus
Circles & Coordinate Representations | 5-Topic Precalculus Bundle

5-topic bundle | 480 problems | Four activity formats

01 Periodic Functions, Radians, and the Unit Circle

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

02 Equivalent Polar Coordinates

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

03 Polar and Rectangular Coordinate Conversion

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

04 Parametric Circles

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

05 Implicit Relations and Curves

[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.

40 PDFs and 5 READMEs; 685 buyer PDF pages across the 5 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.

AP Precalculus
Periodic Functions, Radians, and the Unit Circle

Periodic Functions, Radians, and the Unit Circle | APPC-U03-COMB-P01-P02

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 directed radian measure, supported periodicity claim, recurrence rates and range comparison, exact degrees, exact radians and exact ordering.
8 PDFs and a README; 131 buyer pages.

AP Precalculus

**Periodic Functions, Radians, and
the Unit Circle**

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.

Express $-2\frac{\pi}{9}$ radians as an exact directed angle in degrees.

Bank label: _____

AP Precalculus

Periodic Functions, Radians, and the Unit Circle

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. A value without its unit is not a complete answer.

On a circle of radius 4 m, a point rotates through $\frac{3}{8}$ radians. Find the directed arc displacement s and state whether the motion is clockwise or counterclockwise. _____ _____	For the directed angle $13\frac{\pi}{6}$, describe its terminal ray and list every coterminal representative in the interval $(\pi, 5\pi]$. Respect the endpoint symbols. _____ _____
An exact periodic graph has period 9. A cycle marker occurs at $t = 5$; the graph reaches a specified decreasing phase 4 time units after every marker. Is $t = 38$ that same phase? Give an equivalent cycle window beginning at the marker. _____ _____	For the directed angle $15\frac{\pi}{8}$, describe its terminal ray and list every coterminal representative in the interval $(0, 4\pi)$. Respect the endpoint symbols. _____ _____

AP Precalculus

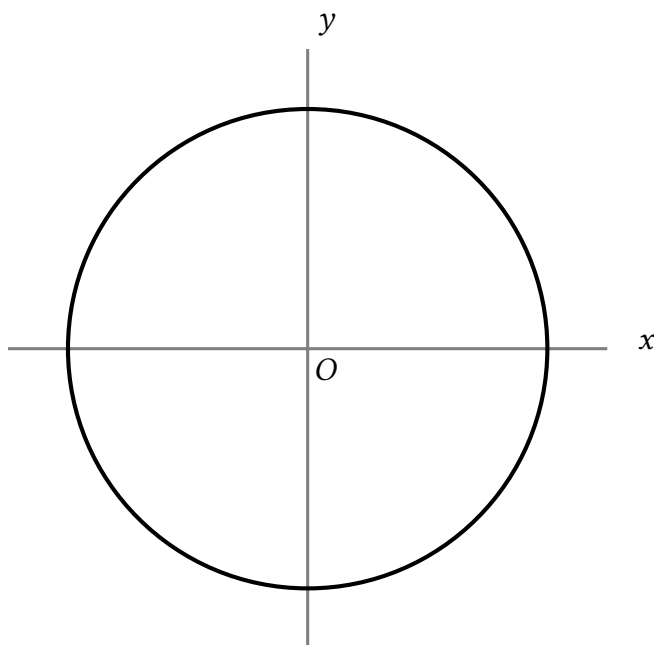
Periodic Functions, Radians, and the Unit Circle

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.

Incoming: 105°

Point $P = (\frac{8}{17}, y)$ lies on the unit circle and is below the x -axis. Find y and verify the point.



Your response: _____

AP Precalculus

Periodic Functions, Radians, and the Unit Circle

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 claims that the smallest period is 7 time units for these exact repeating (sample index, value) pairs: (0, 78); (1, 71); (2, 76); (3, 73); (4, 72); (5, 73); (6, 82); (7, 78); (8, 71); (9, 76); (10, 73); (11, 72); (12, 73); (13, 82).

Consecutive sample indices are 3 time units apart. Diagnose the claim, state the corrected smallest period, and cite one decisive comparison.

Identify the error or first invalid claim, give the corrected conclusion, and justify the correction.

sample index	value
0	78
1	71
2	76
3	73
4	72
5	73
6	82

sample index	value
7	78
8	71
9	76
10	73
11	72
12	73
13	82

A circle centered at O has radius 18 cm. A point moves counterclockwise along the circle through an arc of length $\frac{162}{5}$ cm. Find the directed angle in radians and explain how the sign records the sweep direction. Before solving, choose and justify the valid method. Method A: Use radius divided by arc length. Method B: Use signed arc length divided by radius.

Periodic Functions, Radians, and the Unit Circle

Full Worked Solutions - excerpt

Worked example

Problem. Convert the directed rotation 225° to an exact radian measure. Preserve its direction.

Answer. $5\frac{\pi}{4}$ radians

Explanation and check.

Multiply by $\frac{\pi}{180}^\circ$: $225(\frac{\pi}{180}) = 5\frac{\pi}{4}$. The sign is preserved.

Worked example

Problem. Convert the directed rotation -24° to an exact radian measure. Preserve its direction.

Answer. $-2\frac{\pi}{15}$ radians

Explanation and check.

Multiply by $\frac{\pi}{180}^\circ$: $-24(\frac{\pi}{180}) = -2\frac{\pi}{15}$. The sign is preserved.

AP Precalculus
Equivalent Polar Coordinates

Equivalent Polar Coordinates | APPC-U03-P23

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
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Topic focus

Across 96 tasks this topic asks for diagnosis and corrected pair, same or different, distance and location, one pair, one polar pair and equivalence group.

8 PDFs and a README; 157 buyer pages.

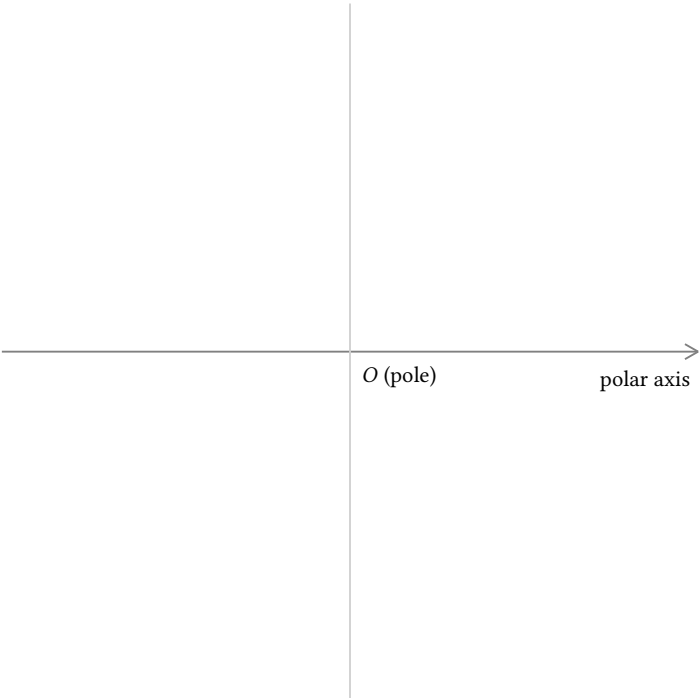
AP Precalculus

Equivalent Polar Coordinates

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.

Find the signed radius r that makes $(r, 5\frac{\pi}{6})$ equivalent to $(5, 11\frac{\pi}{6})$.



Condition or evidence	Supplied value
Incomplete polar record	$(r, 5\frac{\pi}{6})$
Known polar record	$(5, 11\frac{\pi}{6})$

Bank label: _____

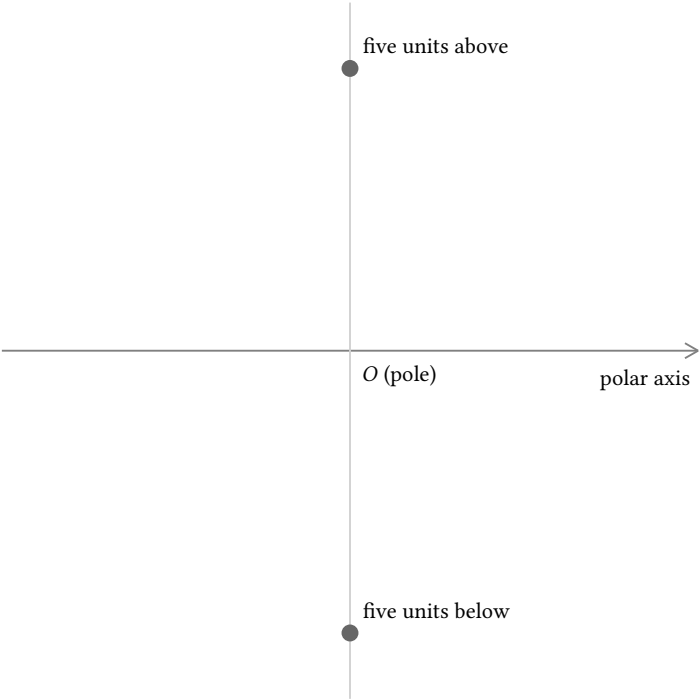
AP Precalculus

Equivalent Polar Coordinates

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. A value without its unit is not a complete answer.

A plot offers points five units above and five units below the pole. Which one represents $(-5, \frac{\pi}{2})$?



Condition or evidence	Supplied value
Candidate points	
	five units above
	five units below
Given polar record	$(-5, \frac{\pi}{2})$

AP Precalculus

Equivalent Polar Coordinates

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.

Incoming: $\theta = -3\frac{\pi}{10}$

An equivalent pair for $(7, 4\frac{\pi}{3})$ is required to have $\theta = \frac{\pi}{3} + 2k\pi$. What must r be for every integer k ?

Solve the card and move only to the card whose incoming header matches the entire requested response.

Condition or evidence	Supplied value
Given angle form	$\theta = \frac{\pi}{3} + 2k\pi$
Incomplete polar record	(r, θ)
Known polar record	$(7, 4\frac{\pi}{3})$

Your response: _____

AP Precalculus

Equivalent Polar Coordinates

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.

For $(-a, \frac{\pi}{6})$ with $a = -5$, evaluate the radius before interpreting the point. Correct the claim that the visible minus sign automatically reverses the ray. Justify the comparison by distinguishing signed radius, ordinary distance and actual location.

Compare the stated cases, methods, or representations and justify the conclusion using the supplied conditions.

Condition or evidence	Supplied value
Assumption	$a = -5$
Given polar record	$(-a, \frac{\pi}{6})$
Student claim to examine	The written minus sign always means a negative radius.

Equivalent Polar Coordinates

Full Worked Solutions - excerpt

Worked example

Problem. Fill in r so the table entry $(r, 13\frac{\pi}{6})$ names the same point as $(3, \frac{\pi}{6})$.

Solve the problem, then match the entire requested response to one unused entry in the Answer Bank.

Candidate	Reference
$(r, 13\frac{\pi}{6})$	$(3, \frac{\pi}{6})$

Answer. $r = 3$

Explanation and check.

The angles differ by 2π , so the radius retains both its magnitude and sign.

Worked example

Problem. Complete the row $(r, 0)$ so it is equivalent to $(-8, \pi)$.

Solve the card and move only to the card whose incoming header matches the entire requested response.

Condition or evidence	Supplied value
Incomplete record	$(r, 0)$
Known record	$(-8, \pi)$

Answer. $r = 8$

Explanation and check.

The negative radius reverses the π ray to the 0 ray at distance 8, so the second pair uses $r = 8$.

AP Precalculus
Polar and Rectangular Coordinate Conversion

Polar and Rectangular Coordinate Conversion | APPC-U03-P24

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
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Topic focus

Across 96 tasks this topic asks for polar pair plus check, polar coordinates, polar pair with quadrant check, rounded polar coordinates, rounded coordinates and positive-radius polar pair.

8 PDFs and a README; 154 buyer pages.

AP Precalculus

Polar and Rectangular Coordinate Conversion

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.

A point has rectangular form $(3, y)$, polar radius 5, and lies above the x -axis. Complete the missing coordinate.

Solve the problem, then match the entire requested response to one unused entry in the Answer Bank.

Condition or evidence	Supplied value
Condition	$y > 0$
Given polar radius	5
Incomplete rectangular record	$(3, y)$

Bank label: _____

For $(-5, 2)$, find positive-radius polar coordinates to the nearest tenth of a degree. Explain the quadrant correction and check the signs of the two projections.

Solve the problem, then match the entire requested response to one unused entry in the Answer Bank.

x	y
-5	2

Condition or evidence	Supplied value
Required angle interval	$0^\circ \leq \theta < 360^\circ$
Precision	nearest tenth of a degree

Bank label: _____

Convert the measured point $(0.4, -6)$ to positive-radius polar form using the stated rounding. Preserve the quadrant near the negative y -axis.

Solve the problem, then match the entire requested response to one unused entry in the Answer Bank.

x	y
0.4	-6

Condition or evidence	Supplied value
Required angle interval	$0^\circ \leq \theta < 360^\circ$
Angle precision	nearest tenth
Radius precision	nearest hundredth

Bank label: _____

A calculator returns a reference angle near 20.6° for $(-8, -3)$. Produce the correct polar angle, radius, and a sign check by reprojection.

Solve the problem, then match the entire requested response to one unused entry in the Answer Bank.

Condition or evidence	Supplied value
Required angle interval	$0^\circ \leq \theta < 360^\circ$
Given rectangular point	
	−8
	−3
Precision	Given angle θ nearest tenth degree Radius nearest hundredth
Given calculator ratio angle	about 20.6°

Bank label: _____

AP Precalculus

Polar and Rectangular
Coordinate Conversion

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.

A positive-radius point has $\theta = 3\frac{\pi}{2}$ and $y = -4$. Determine r and the missing x -coordinate.

Show a complete response in the numbered workspace, preserving requested exactness, units, interval endpoints, and justification.

Condition or evidence	Supplied value
Given angle θ	$3\frac{\pi}{2}$
Radius convention	positive
Given x -coordinate	missing
Given y -coordinate	-4

AP Precalculus

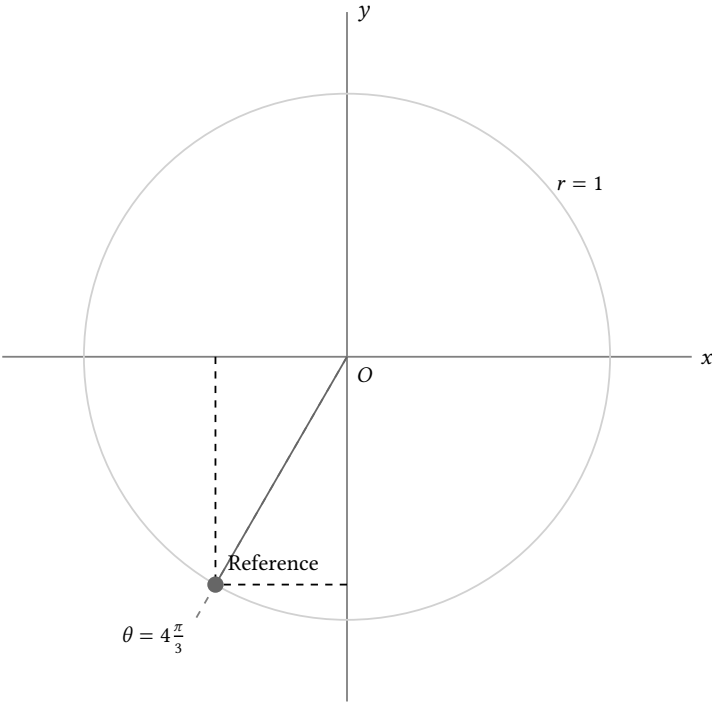
Polar and Rectangular
Coordinate Conversion

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.

Incoming: $(11, 3\frac{\pi}{2})$

Convert $(-9, 4\frac{\pi}{3})$ and explain why both coordinates become positive.



$\cos \theta$	$\sin \theta$
$-\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$

Condition or evidence	Supplied value
Given quadrant to verify	I
Given polar record	$(-9, 4\frac{\pi}{3})$

Your response: _____

AP Precalculus

Polar and Rectangular
Coordinate Conversion

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 converts $(4, \frac{\pi}{6})$ to $(2, 2\sqrt{3})$. Identify the swapped roles and repair the ordered pair.

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

Condition or evidence	Supplied value
Given polar record	$(4, \frac{\pi}{6})$
Student rectangular result to examine	$(2, 2\sqrt{3})$

Polar and Rectangular Coordinate Conversion

Full Worked Solutions - excerpt

Worked example

Problem. A point has rectangular form $(3, y)$, polar radius 5, and lies above the x -axis. Complete the missing coordinate. Solve the problem, then match the entire requested response to one unused entry in the Answer Bank.

Condition or evidence	Supplied value
Condition	$y > 0$
Given polar radius	5
Incomplete rectangular record	$(3, y)$

Answer. $y = 4$

Explanation and check.

From $3^2 + y^2 = 5^2$, $y^2 = 16$. The upper-half-plane condition selects $y = 4$ rather than -4 .

Worked example

Problem. A point has radius 10, $y = -6$, and lies left of the y -axis. Reconstruct x .

Solve the problem, then match the entire requested response to one unused entry in the Answer Bank.

Condition or evidence	Supplied value
Condition	$x < 0$
Given polar radius	10
Incomplete rectangular record	$(x, -6)$

Answer. $x = -8$

Explanation and check.

The norm equation gives $x^2 + 36 = 100$, so $x = \pm 8$. The left-half-plane condition selects $x = -8$.

AP Precalculus
Parametric Circles

Parametric Circles | APPC-U04-P06
96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
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Topic focus
Across 96 tasks this topic asks for center, radius, start, orientation, exact set-builder list, interval, motion comparison and times, set, direction, parameter-rate comparison and locus, start, period, orientation.
8 PDFs and a README; 139 buyer pages.

AP Precalculus

Parametric Circles

Name: _____ Date: _____ Class: _____

Solve the problem, then match the entire requested response to one unused entry in the Answer Bank.

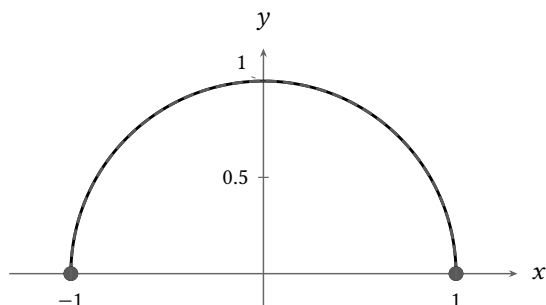
Read the geometric and traversal features from the paired rule.

Solve the problem, then match the entire requested response to one unused entry in the Answer Bank.

Condition or evidence	Supplied value
Original parameter range or clock definition	t real
Given $x(t)$	$3 + 4 \cos(t)$
Given $y(t)$	$-2 + 4 \sin(t)$

Bank label: _____

Compare the two restricted maps as arc sets and as directed traversals.



Condition or evidence	Supplied value
Original parameter range or clock definition	$0 \leq t \leq \pi$ and $-\pi \leq s \leq 0$
First motion rule	$(\cos t, \sin t)$
Second motion rule	$(\cos(-s), \sin(-s))$

Bank label: _____

Model the ninety-second clockwise revolution from the delayed leftmost start.

Solve the problem, then match the entire requested response to one unused entry in the Answer Bank.

Condition or evidence	Supplied value
Given center	1 2
Original parameter range or clock definition	time t in seconds
Given direction	clockwise
Period seconds	90
Given radius	3
Start point	-2 2
Start time	30

Bank label: _____

Account for the doubled angle when choosing the lower half-circle parameter window.

Solve the problem, then match the entire requested response to one unused entry in the Answer Bank.

Condition or evidence	Supplied value
Given arc	lower semicircle
Original parameter range or clock definition	to be selected
Given ending position	1 0
Given endpoint membership	both included
Given direction	counterclockwise
Given coordinate rule	$x = \cos(2t), y = \sin(2t)$
Given starting position	-1 0

Bank label: _____

AP Precalculus

Parametric Circles

Name: _____ Date: _____ Class: _____

Begin at START. Solve the card, use the complete requested response as the outgoing match, and move to the unique card whose incoming header matches it; continue until FINISH.

Incoming: $x = 3 \sin(t)$, $y = 2 - 3 \cos(t)$. Construct a rule that begins at the top and initially moves right. Solve the card, use the complete requested response as the outgoing match, and move to the unique card whose incoming header matches it; continue until FINISH. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Condition or evidence</th><th style="width: 50%;">Supplied value</th></tr> </thead> <tbody> <tr> <td rowspan="2">Given center</td><td style="text-align: center;">-3</td></tr> <tr> <td style="text-align: center;">2</td></tr> <tr> <td>Original parameter range or clock definition</td><td>t real</td></tr> <tr> <td>Given direction</td><td>clockwise</td></tr> <tr> <td>Given radius</td><td>4</td></tr> <tr> <td rowspan="2">Given starting position</td><td style="text-align: center;">-3</td></tr> <tr> <td style="text-align: center;">6</td></tr> </tbody> </table> Your response: _____	Condition or evidence	Supplied value	Given center	-3	2	Original parameter range or clock definition	t real	Given direction	clockwise	Given radius	4	Given starting position	-3	6	Incoming: $x = -4 \cos(t)$, $y = \sin(t)$. Can any increasing parameter interval satisfy the endpoint and sweep requirements simultaneously? Solve the card, use the complete requested response as the outgoing match, and move to the unique card whose incoming header matches it; continue until FINISH. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Condition or evidence</th><th style="width: 50%;">Supplied value</th></tr> </thead> <tbody> <tr> <td>Original parameter range or clock definition</td><td>to be selected</td></tr> <tr> <td rowspan="2">Given ending position</td><td style="text-align: center;">1</td></tr> <tr> <td style="text-align: center;">0</td></tr> <tr> <td>Required sweep</td><td>exactly one-half revolution</td></tr> <tr> <td>Given coordinate rule</td><td>$x = \cos(t)$, $y = \sin(t)$</td></tr> <tr> <td rowspan="2">Given starting position</td><td style="text-align: center;">1</td></tr> <tr> <td style="text-align: center;">0</td></tr> </tbody> </table> Your response: _____	Condition or evidence	Supplied value	Original parameter range or clock definition	to be selected	Given ending position	1	0	Required sweep	exactly one-half revolution	Given coordinate rule	$x = \cos(t)$, $y = \sin(t)$	Given starting position	1	0
Condition or evidence	Supplied value																												
Given center	-3																												
	2																												
Original parameter range or clock definition	t real																												
Given direction	clockwise																												
Given radius	4																												
Given starting position	-3																												
	6																												
Condition or evidence	Supplied value																												
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	0																												
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Given coordinate rule	$x = \cos(t)$, $y = \sin(t)$																												
Given starting position	1																												
	0																												

AP Precalculus

Parametric Circles

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.

The radius, phase, and orientation are correct, but one center coordinate is not. Repair it.

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

Condition or evidence	Supplied value
Original parameter range or clock definition	t real
Student rule to examine	$x = 1 + 3 \cos(t), y = 2 + 3 \sin(t)$
Given target requirements	Given center $1, -2$ Given direction counterclockwise Given radius 3 Given starting position $4, -2$

Parametric Circles

Full Worked Solutions - excerpt

Worked example

Problem. Read the basic circle geometry from the constants and amplitudes.

Solve the problem, then match the entire requested response to one unused entry in the Answer Bank.

Condition or evidence	Supplied value
Original parameter range or clock definition	t real
Given $x(t)$	$-2 + 6 \cos(t)$
Given $y(t)$	$4 + 6 \sin(t)$

Answer. Center $(-2, 4)$, radius 6.

Explanation and check.

The coordinate midlines are -2 and 4 , and both components have amplitude 6.

Worked example

Problem. Identify the circle's center and radius from the paired rule.

Solve the problem, then match the entire requested response to one unused entry in the Answer Bank.

Condition or evidence	Supplied value
Original parameter range or clock definition	t real
Given $x(t)$	$5 + 2 \cos(t)$
Given $y(t)$	$1 + 2 \sin(t)$

Answer. Center $(5, 1)$ and radius 2.

Explanation and check.

The additive constants locate the center, and the equal sinusoidal amplitudes give the radius.

AP Precalculus

Implicit Relations and Curves

Implicit Relations and Curves | APPC-U04-P07

96 problems · Four activity formats

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Topic focus

Across 96 tasks this topic asks for consistency judgment, possible entries, member set, invalid row, inequality and rule and restriction, rule, y-domain.

8 PDFs and a README; 104 buyer pages.

AP Precalculus

Implicit Relations and Curves

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.

Exactly one row misses the relation. Which one?

Given: domain: x, y real; relation: $(x - 2)(y + 1) = 6$; rows: $(5, 1)$; $(-1, -3)$; $(4, 2)$; $(3, 4)$

Required response

x	y
5	1
-1	-3
4	2
3	4

Bank label: _____

Identify every coordinate pair that satisfies the scaled relation.

Given: domain: x, y real; relation: $\frac{x^2}{4} + \frac{y^2}{9} = 1$; rows: $(0, 3)$; $(2, 0)$; $(1, 2)$; $(\sqrt{2}, 3\frac{\sqrt{2}}{2})$

Required response

x	y
0	3
2	0
1	2
$\sqrt{2}$	$3\frac{\sqrt{2}}{2}$

Bank label: _____

How many rows lie on the relation, and which are they?

Given: domain: x, y real; relation: $2x - y = 5$; rows: $(3, 1)$; $(\frac{7}{2}, 2)$; $(\frac{1}{2}, -4)$; $(-1, -7)$

Required response

x	y
3	1
$\frac{7}{2}$	2
$\frac{1}{2}$	-4
-1	-7

Bank label: _____

Mark the valid rows, then explain what they show about y -values at $x = 10$.

Given: domain: x, y real; relation: $y^2 = x - 1$; rows: $(x: 10; y: 3)$; $(x: 10; y: -3)$; $(x: 10; y: 0)$

Required response

x	y
10	3
10	-3
10	0

Bank label: _____

AP Precalculus

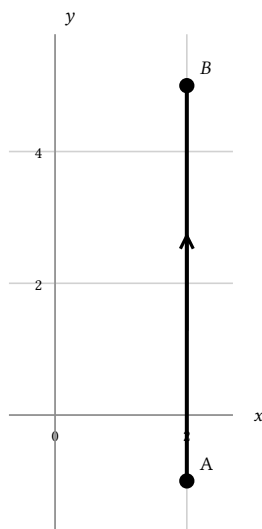
Implicit Relations and Curves

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.

Describe both coordinate changes along the arrow.

Given graph



A: $(2, -1)$

B: $(2, 5)$

AP Precalculus

Implicit Relations and Curves

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.

Which proposed points belong to the relation?

Given: candidates: $(5, 3)$; $(5, -3)$; $(5, 1)$; domain: x, y real; relation: $y^2 = x + 4$

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

x	y
5	3
5	-3
5	1

A student claims: "All four listed rows satisfy $x^2 - y = 3$." Diagnose the first invalid step or assumption, give the corrected conclusion, and justify the correction. Then complete the stated task: Three rows satisfy the relation. Identify the one that does not.

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

x	y
-1	-2
0	-3
2	1
3	5

Implicit Relations and Curves

Full Worked Solutions - excerpt

Worked example

Problem. Determine whether the relation has any real point above this x -value.

Given: domain: x, y real; input $x: 3$; relation: $(y - 1)^2 = x - 4$

Answer. It has none.

Explanation and check.

Substitution would make the square $(y - 1)^2$ equal -1 , impossible over the reals.

Worked example

Problem. Give a complete explicit description of the relation.

Given: domain: x, y real; relation: $y^2 = (x - 1)^2$

Answer. $y = x - 1$ or $y = 1 - x$, for every real x .

Explanation and check.

Equality of the squares means $y = \pm(x - 1)$; the two lines meet at $(1, 0)$.