

AP Precalculus

Parametric Circles

Parametric Circles | APPC-U04-P06

96 problems · Four activity formats

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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.

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Name: _____ Date: _____ Class: _____

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

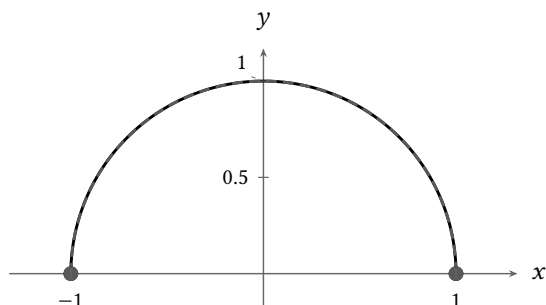
Read the geometric and traversal features from the paired rule.

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: _____

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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
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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.

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 $4, -2$

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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.