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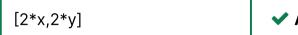
Review

A normal vector to the circle at an arbitrary point

1.0/1 point (graded)

Let c be the circle of radius 2 around the origin. The curve c is defined by the equation $x^2+y^2=4$. For a given point (x,y) in c, find a vector \vec{n} which is normal to c at (x,y).

(Enter a vector components separated by commas, and surrounded by square brackets: [a,b].)



✓ Answer: [2*x,2*y]

Solution:

The curve c is the level curve of the function $g(x,y)=x^2+y^2$. And the gradient is normal to the level curves of a function. Thus for any point on the circle, the gradient vector of $\nabla g(x,y)=\langle 2x,2y\rangle$ is normal to the level curve, the circle of radius 2.

Submit

You have used 1 of 20 attempts

• Answers are displayed within the problem

Sanity check

1.0/1 point (graded)

As in the last problem, let c be the circle of radius 2 around the origin. Let f(x,y) = y. Just using your geometric understanding, find the point of the curve c where f is maximal.

(Enter the point as an ordered pair surrounded by round parentheses: (a,b).)

(0,2)

✓ Answer: (0,2)

Confirm that abla f is perpendicular to c at this point.

Submit

You have used 2 of 10 attempts

Answers are displayed within the problem

Find all points where the gradient is normal to the circle

3.0/3 points (graded)

As in the last problem, let c be the circle of radius 2 around the origin. Let f(x,y) = xy. Find all the points on the curve c where ∇f is normal to c. Find the maximum of f on the curve c and the minimum of f on the curve c.

(Enter the point as an ordered pair surrounded by round parentheses. Separate multiple points by semicolons. E.g. (a,b); (c,d); (e,f).)

Points where abla f is normal to c.

(sqrt(2),sqrt(2));(-sqrt(2),sqrt



■ Calculator



2		✓ Answer: 2		
inimum of $m{f}$	on <i>c</i> :			
-2		✓ Answer: -2		
Submit	You have used 3 of 25 a	ttempts		
Answers	are displayed within t	he problem		
A curve in the plane and a function pic: Unit 3: Optimization / 1. A curve in the plane and a function				Hide Discussion
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Rec[3-11-1 part 3] Find all points				7
<u> </u>	ity TA			*
■ Was this kind of like a trick question?				4
Resource	to bolster geometric intu	ition of Lagrange multipliers.		2
		problem. Contact course staff in the 1 and 3 of this recitation. I tried both wi		4
Stumped! What are th		in a normal vector? Does it have to be a r	number, a variable, or an equation?	10
	ntax "Find all points"	ering points? I can't spot the errorro	und paranthasas, sami colons points	3 everything is
what is wio	<u>ong with my syntax .when em</u>	<u>tering points ? I can't spot the erroro.</u>	<u>una parentneses ,semi colons points</u>	<u>. everytriing is</u>
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