

WebAssign

Hw 29 (16.3): Fundamental Thm. of Line Integrals (Homework)

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MA 261 Fall 2012, section 121, Fall 2012

Instructor: David Daniels

Current Score : 20 / 20

Due : Thursday, November 8 2012 11:00 PM EST

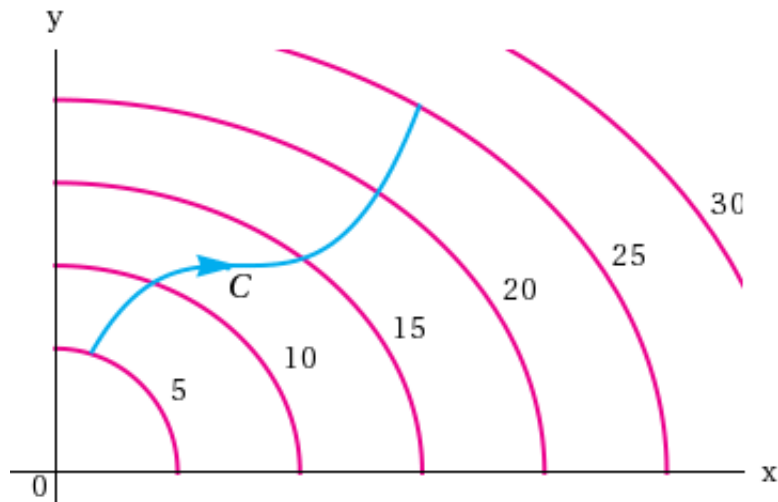
1. 2.5/2.5 points | [Previous Answers](#)

SCalcET7 16.3.001.

The figure shows a curve C and a contour map of a function f whose gradient is continuous. Find

$$\int_C \nabla f \cdot d\mathbf{r}.$$

20



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2. 2.5/2.5 points | [Previous Answers](#)

SCalcET7 16.3.002.

A table of values of a function f with continuous gradient is given. Find $\int_C \nabla f \cdot d\mathbf{r}$, where C has the parametric equations below.

$$x = t^2 + 1 \quad y = t^5 + t \quad 0 \leq t \leq 1$$

2



$x \backslash y$	0	1	2
0	1	6	3
1	4	5	6
2	8	1	6

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3. 2.5/2.5 points | [Previous Answers](#)

SCalcET7 16.3.003.M1.

Determine whether or not \mathbf{F} is a conservative vector field. If it is, find a function f such that $\mathbf{F} = \nabla f$. If it is not, enter NONE.

$$\mathbf{F}(x, y) = (2x - 6y) \mathbf{i} + (-6x + 14y - 5) \mathbf{j}$$

 $f(x, y) =$


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4. 2.5/2.5 points | [Previous Answers](#)

SCalcET7 16.3.004.

Determine whether or not \mathbf{F} is a conservative vector field. If it is, find a function f such that $\mathbf{F} = \nabla f$. If it is not, enter NONE.

$$\mathbf{F}(x, y) = e^x \sin y \mathbf{i} + e^x \cos y \mathbf{j}$$

 $f(x, y) =$ 

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5. 2.5/2.5 points | [Previous Answers](#)

SCalcET7 16.3.005.

Determine whether or not \mathbf{F} is a conservative vector field. If it is, find a function f such that $\mathbf{F} = \nabla f$. If it is not, enter NONE.

$$\mathbf{F}(x, y) = e^x \cos y \mathbf{i} + e^x \sin y \mathbf{j}$$

 $f(x, y) =$ 

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6. 2.5/2.5 points | [Previous Answers](#)

SCalcET7 16.3.012.MI.

Consider \mathbf{F} and C below.

$$\mathbf{F}(x, y) = x^2 \mathbf{i} + y^2 \mathbf{j}$$

C is the arc of the parabola $y = 4x^2$ from $(1, 4)$ to $(2, 16)$

(a) Find a function f such that $\mathbf{F} = \nabla f$.

$f(x, y) =$



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(b) Use part (a) to evaluate $\int_C \nabla f \cdot d\mathbf{r}$ along the given curve C .



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7. 2.5/2.5 points | [Previous Answers](#)

SCalcET7 16.3.015.

Consider \mathbf{F} and C below.

$$\mathbf{F}(x, y, z) = yz \mathbf{i} + xz \mathbf{j} + (xy + 16z) \mathbf{k}$$

 C is the line segment from $(3, 0, -3)$ to $(6, 5, 1)$
(a) Find a function f such that $\mathbf{F} = \nabla f$.

$$f(x, y, z) =$$



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(b) Use part (a) to evaluate $\int_C \nabla f \cdot d\mathbf{r}$ along the given curve C .


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8. 2.5/2.5 points | [Previous Answers](#)

SCalcET7 16.3.024.

Find the work done by the force field \mathbf{F} in moving an object from P to Q .

$$\mathbf{F}(x, y) = e^{-y} \mathbf{i} - xe^{-y} \mathbf{j}$$

 $P(0, 4), \quad Q(5, 0)$



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