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← MC 113, section A, Spring 2020

14.3 -14.4 Derivadas Parciales (Homework)

Christiaan Ketelaar Universidad Francisco Marroquin



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2/28/2020

14.3 -14.4 Derivadas Parciales - MC 113, section A, Spring 2020 | WebAssign



Previous Answers

SCALCET8 14.3.012.

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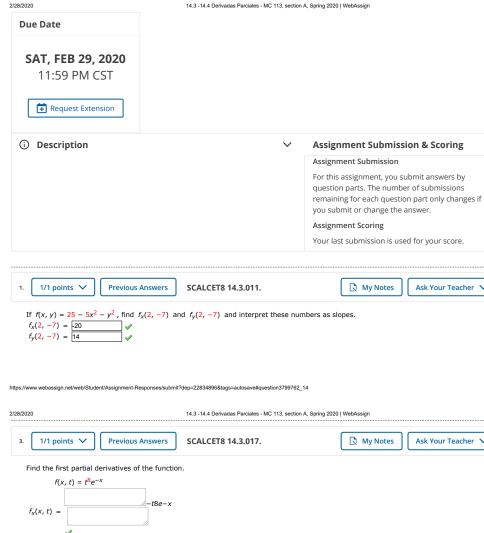
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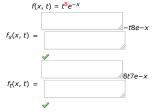
Find $f_X(1, 0)$ and $f_Y(1, 0)$ and interpret these numbers as slopes for the following equation.

$$f(x, y) = \sqrt{4 - x^2 - 3y^2}$$

$$f_X(1, 0) = -1\sqrt{3}$$

$$f_Y(1, 0) = 0$$





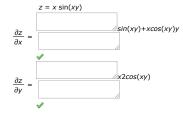
1/1 points 🗸 **Previous Answers** SCALCET8 14.3.020.

My Notes Ask Your Teacher 🗸

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Find the first partial derivatives of the function.



SCALCET8 14.3.028.

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My Notes

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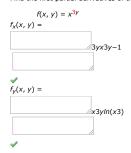
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SCALCET8 14.3.031.

Find the first partial derivatives of the function.

Previous Answers

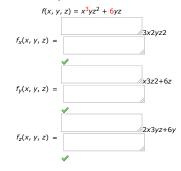


1/1 points 🗸

Find the first partial derivatives of the function.

Previous Answers

1.5/1.5 points 💙



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2/2 points 🗸

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SCALCET8 14.3.051.

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Previous Answers

7. 1.5/1.5 points 🗸

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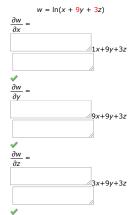
Previous Answers SCALCET8 14.3.033.

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My Notes

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Find the first partial derivatives of the function.



Find $\partial z/\partial x$ and $\partial z/\partial y$. (a) z = f(x) + g(y) $\partial z/\partial x$ $\partial z/\partial y$ 0 0 1 1 f'(x) f'(x) g'(y) g'(y) f'(x) + g(y) $\bigcirc f'(x) + g(y)$ f(x) + g'(y) \circ f(x) + g'(y)f'(x) + g'(y)f'(x) + g'(y)onone of the none of the above above

(b) z = f(x + y) $\partial z/\partial x$

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 $\partial z/\partial y$

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10.

2/2 points 🗸

0

0 1

f'(x)

f'(y)

f'(x + y)

above

none of the

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SCALCET8 14.3.056.

My Notes



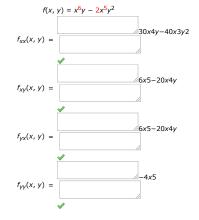
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Find all the second partial derivatives.



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Previous Answers

0

1

f'(x)

f'(y)

 \odot f'(x + y)

above

none of the

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11. 1/1 points 🗸

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SCALCET8 14.3.069.

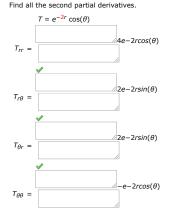
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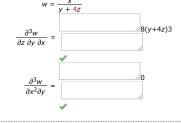
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10/21

Find the indicated partial derivatives.

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12. 1/1 points 🗸

Previous Answers

SCALCET8 14.3.083.

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The total resistance R produced by three conductors with resistances R_1 , R_2 , R_3 connected in a parallel electrical circuit is given by the formula

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}.$$
 Find $\frac{\partial R}{\partial R_1}$.
$$\frac{\partial R}{\partial R_1} =$$

$$1R21(1R1+1R2+1R3)2$$

15.

SCALCET8 14.3.510.XP.

SCALCET8 14.3.098. -/1 points ∨

My Notes Ask Your Teacher 💙

The paraboloid $z = \frac{5}{x} - x - x^2 - \frac{2}{y^2}$ intersects the plane $x = \frac{2}{y}$ in a parabola. Find parametric equations in terms of t for the tangent line to this parabola at the point (2, 3, -19). (Enter your answer as a comma-separated list of equations. Let x, y, and z be in terms of t.)

SCALCET8 14.3.099. -/1 points ∨

My Notes

Ask Your Teacher 🗸

The ellipsoid $3x^2 + 5y^2 + z^2 = \frac{96}{10}$ intersects the plane y = 2 in an ellipse. Find parametric equations for the tangent line to this ellipse at the point (5, 2, 1). (Enter your answer as a comma-separated list of equations. Let x and y be in terms of t.)

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-/0 points ∨

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SCALCET8 14.3.527.XP.

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Ask Your Teacher 💙

Find the first partial derivatives of the function.

$$f(x, y) = \int_{y}^{x} \cos(t^{5}) dt$$

$$f_{x}(x, y) =$$

 $f_y(x, y) =$

-/1 points ∨

SCALCET8 14.4.001.

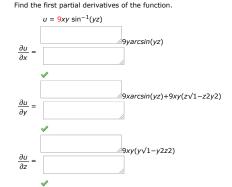
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Find an equation of the tangent plane to the given surface at the specified point.

$$z = 4x^2 + y^2 - 9y$$
, (1, 4, -16)

3/0 points 🗸



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. Both f_X and f_V are

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18.

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-/0 points ∨

SCALCET8 14.4.011.

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and $f_y(3, 2) =$

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Explain why the function is differentiable at the given point.

 $f(x, y) = 9 + x \ln(xy - 5),$ (3, 2)

$$f_{\chi}(x,\,y)=$$
 and $f_{\gamma}(x,\,y)=$ The partial derivatives are , so $f_{\chi}(3,\,2)=$ continuous functions for $xy>$ and f is differentiable

and f is differentiable at (3, 2). continuous functions for xy >

Find the linearization L(x, y) of f(x, y) at (3, 2).



SCALCET8 14.4.501.XP.MI.

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Find an equation of the tangent plane to the given surface at the specified point.

$$z = 4(x-1)^2 + 6(y+3)^2 + 6$$
, (2, -2, 16)

-/1 points ∨

SCALCET8 14.4.507.XP.

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Find an equation of the tangent plane to the given surface at the specified point.

$$z = y \ln(x), (1, 7, 0)$$

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17/21

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SCALCET8 14.4.AE.001.

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Video Example (1)

EXAMPLE 1 Find the tangent plane to the elliptic paraboloid $z = 2x^2 + 3y^2$ at the point (1, 1, 5).

SOLUTION Let $f(x, y) = 2x^2 + 3y^2$. Then



Then this equation gives the equation of the tangent plane at (1, 1, 5) as

$$z-$$
 = $(x-1)+$ $(y-1)$

or



-/1 points ∨ SCALCET8 14.4.509.XP. 21.

Find the linear approximation of the function below at the indicated point. $f(x, y) = \sqrt{\frac{41 - x^2 - 4y^2}{41 - x^2}}$ at (4, 2)

 $f(x, y) \approx$

Use this approximation to find f(4.07, 2.05). (Round your answer to three decimal places.)

f(4.07, 2.05) ≈

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23. -/2 points ∨ SCALCET8 14.4.AE.002.

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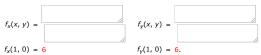
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Video Example (1)

EXAMPLE 2 Show that $f(x, y) = 6xe^{xy}$ is differentiable at (1, 0) and find its linearization there. Then use it to approximate f(1.1, -0.1).

SOLUTION The partial derivatives are



Both f_x and f_y are continuous functions, so f is differentiable. The linearization is

$$L(x, y) = f(1, 0) + f_X(1, 0)(x - 1) + f_Y(1, 0)(y - 0)$$

$$6 + ($$

$$=$$

$$) + 6 \cdot y$$

The corresponding linear approximation is

 $6xe^{xy}$ ≈

14.3 -14.4 Derivadas Parciales - MC 113, section A, Spring 2020 | WebAssign $f(1.1, -0.1) \approx L(1.1, -0.1) =$

Compare this with the actual value. (Round your answer to five decimal places.)

 $f(1.1, -0.1) = 6.6e^{-0.11} \approx$

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