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sandipan\_dey ~

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Recitation due Aug 4, 2021 20:30 IST Completed



**Practice** 

#### 1. Find the value and partial derivatives

3/3 points (graded)

Consider the function  $g\left(x,y
ight)=-2x^2+y^3/4+x^4/2-3/4$ .

Evaluate the function and its partial derivatives at the point (0,-1).

$$g\left(0,-1
ight)=$$
  $ightharpoonup$  Answer: -1

$$g_x\left(0,-1
ight)=igcap_0$$
 Answer: 0

$$g_y(0,-1) = 3/4$$
 Answer: 0.75

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You have used 1 of 10 attempts

**1** Answers are displayed within the problem

## 2. Find the formula in term of changes in x and y

1.0/1 point (graded)

Consider the function  $g\left(x,y
ight)=-2x^2+y^3/4+x^4/2-3/4$  as above.

Use your computation above to approximate the function g(x,y) near the point (0,-1).

That is, find the linear approximation formula for  $g\left(\Delta x,-1+\Delta y\right)$  in terms of  $\Delta x$  and  $\Delta y$ .

(Type Deltax for  $\Delta x$ . Type Deltay for  $\Delta y$ . Note that the answer box is case sensitive.)

$$g\left(\Delta x,-1+\Delta y
ight)pprox$$
 -1+3/4\*Deltay  $ightharpoonup$  Answer: -1+0.75\*Deltay

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You have used 1 of 15 attempts

Answers are displayed within the problem

#### 3. Find the formula for the plane

2.0/2 points (graded)

Use your computation above to find a formula for the tangent plane  $T_{(0,-1)}\left(x,y
ight)$  that is tangent to the function  $g\left(x,y
ight)=-2x^2+y^3/4+x^4/2-3/4$  at the point (0,-1).

(Your function should be a function of x and y, not  $\Delta x$  and  $\Delta y$ .)

$$T_{(0,-1)}(x,y) = \begin{bmatrix} 3/4*y-1/4 \end{bmatrix}$$
 Answer: -0.25+0.75\*y



Sanity check: Check the value of  $T\left( x,y\right)$  at the point  $\left( 0,-1\right)$ .

$$T_{(0,-1)}\left(0,-1
ight)= igcap_{-1}$$
  $ightharpoonup$  Answer: -1

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You have used 1 of 15 attempts

**1** Answers are displayed within the problem

### 4. Same function, new point, find the tangent plane

2.0/2 points (graded)

Find the equation for the tangent plane to the function  $T_{(1,1)}\left(x,y\right)$  that is tangent to the function  $g\left(x,y\right)=-2x^2+y^3/4+x^4/2-3/4$  at the point (1,1) in two ways.

First find a formula for the linear approximation  $g\left(1+\Delta x,1+\Delta y
ight)$  as a function of  $\Delta x$  and  $\Delta y$ .

(Type Deltax for  $\Delta x$ . Type Deltay for  $\Delta y$ . Note that the answer box is case sensitive.)

$$g\left(1+\Delta x,1+\Delta y
ight)pprox$$
 -2-2\*Deltax+3/4\*Deltay  $wo$  Answer: -2-2\*Deltax+0.75\*Deltay

Convert that formula to an equation for a plane in terms of x and y.

(Your function should be a function of x and y, not  $\Delta x$  and  $\Delta y$ .)

$$T_{(1,1)}(x,y) =$$
 Answer: -0.75-2\*x+0.75\*y

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You have used 1 of 15 attempts

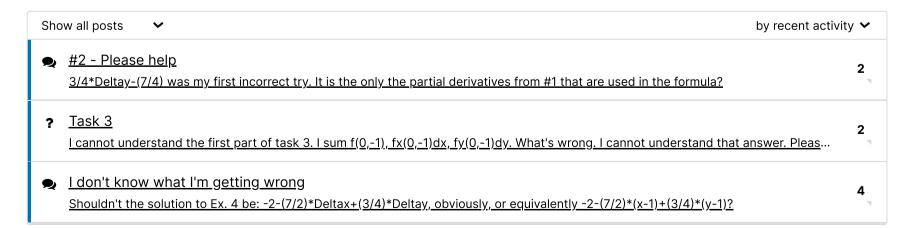
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#### 14. Practice finding tangent planes

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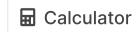














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