Calculating Hessians

TOTAL POINTS 5

1.Question 1

In this quiz, you will calculate the Hessian for some functions of 2 variables and functions of 3 variables.

For the function f(x,y) = x^3y + x + 2y, calculate the Hessian matrix H =

[[$\partial_{x,x}f$, $\partial_{x,y}f$],[$\partial_{y,x} f$ $\partial_{y,y}f$]]

1 / 1 point

- H =[$6xy{-}3x2{-}3x20$]
- H =[$03x23x26xy$]
- H =[$0{-}3x2{-}3x26xy$]
- (selected) H =[[$6xy$ $3x$^2], [$3x$^2 0]]

2.Question 2

For the function f(x,y) = e^xcos(y), calculate the Hessian matrix.

1 / 1 point

- (selected) H =[e^$x cos(y)$ $-e x sin(y)$], [$-e x sin(y)$ $-e x cos(y)$]]
- H =[$-e x cos(y) e x sin(y) - e x sin(y) - e x cos(y)$]
- H =[$-e x cos(y) - e x sin(y) - e x sin(y) e x cos(y)$]
- H =[$-e x cos(y) - e x sin(y) e x sin(y) - e x cos(y)$]

3.Question 3

For the function f(x,y) = x^2/2 + xy + y^2/2, calculate the Hessian matrix.

1 / 1 point

- H =[1−1−11]
- H =[1001]
- H =[1−101]
- (selected) H =[[1 1], [1 1]]

4.Question 4

For the function f(x,y,z) = x^2e^(-y)cos(z), calculate the Hessian matrix H =

$\partial_{x,x}f\partial_{y,x}f\partial_{z,x}f\partial_{x,y}f\partial_{y,y}f\partial_{z,y}f\partial_{x,z}f\partial_{y,z}f\partial_{z,z}f$

1 / 1 point

H =
⎡⎣⎢ $2xe^{-y}cos(z) - 2e^{-y}cos(z) - 2x^2e^{-y}sin(z) - 2e^{-y}cos(z)x^2e^{-y}cos(z)x^2e^{-y}sin(z) - 2e^{-y}sin(z)x^2e^{-y}sin(z) - 2xe^{-y}cos(z)$ ⎤⎦⎥

H =
⎡⎣⎢ $2e^{-y}cos(z)2xe^{-y}cos(z)2xe^{-y}sin(z)2xe^{-y}cos(z)x^2e^{-y}cos(z)x^2e^{-y}sin(z)2xe^{-y}sin(z)x^2e^{-y}sin(z)x^2e^{-y}cos(z)$ ⎤⎦⎥

H =
⎡⎣⎢ $2xe^{-y}cos(z)2xe^{-y}cos(z)2xe^{-y}sin(z)x^2e^{-y}cos(z)x^2e^{-y}cos(z)2xe^{-y}sin(z)2xe^{-y}sin(z)x^2xe^{-y}sin(z)2xe^{-y}cos(z)$ ⎤⎦⎥

H = [[$2e$^($-y$) $cos(z)$ $-2xe$^($-y$) $cos(z)$ $-2xe$^($-y$) $sin(z)$], [$-2xe$^($-y$) $cos(z)$ x^(2) e^($-y$) $cos(z)$ x^(2) e^($-y$) $sin(z)$], [$-2xe$^($-y$) $sin(z)$ x^(2) e^($-y$) $sin(z)$ - x^(2) e^($-y$) $cos(z)$]]

5.Question 5

For the function f(x, y, z) = xe^y + y^2cos(z), calculate the Hessian matrix.

1 / 1 point

H=⎡⎣⎢ $0e^y0e^yxe^y+2cos(z)2ysin(z)02ysin(z)y^2cos(z)$ ⎤⎦⎥

H =[[0 e^(y) 0], [e^y xe^(y)+ $2cos(z)$ $-2ysin(z)$], [0 $-2ysin(z)$ $-y$^(2) $cos(z)$ ⎤⎦⎥

H=⎡⎣⎢ $0e^y0e^yxe^y+2sin(z)-2ycos(z)0-2ycos(z)-y^2sin(z)$ ⎤⎦⎥

H=⎡⎣⎢ $0e^y0e^yxe^y+2sin(z)2ycos(z)02ycos(z)y^2sin(z)$ ⎤⎦