5/5 points (100.00%)

Quiz, 5 questions

### ✓ Congratulations! You passed!

Next Item



1/1 points

1.

In this assessment, you will be tested on all of the different topics you have in covered this module. Good luck!

Calculate the Jacobian of the function  $f(x,y,z)=x^2cos(y)+e^zsin(y)$  and evaluate at the point  $(x,y,z)=(\pi,\pi,1).$ 

$$\bigcirc \quad J(x,y,z) = (-2\pi,-e,1)$$

$$\int J(x,y,z) = (-2\pi, -e, 0)$$

Correct

$$\int J(x,y,z) = (-2\pi,e,1)$$

1 / 1

## Assessment: Jacobians and Hessians

5/5 points (100.00%)

Quiz, 5 questions

2.

Calculate the Jacobian of the vector valued functions:

 $u(x,y)=x^2y-cos(x)sin(y)$  and  $v(x,y)=e^{x+y}$  and evaluate at the point  $(0,\pi)$ .

- $egin{bmatrix} 0 & e^\pi \ 1 & e^\pi \end{bmatrix}$
- $\begin{bmatrix} e^\pi & 1 \\ 0 & e^\pi \end{bmatrix}$

Correct

Well done!

 $\begin{bmatrix}
e^{\pi} & 1 \\
e^{\pi} & 0
\end{bmatrix}$ 

5/5 points (100.00%)

Quiz, 5 questions

Calculate the Hessian for the function  $f(x,y) = x^3 cos(y) - x sin(y).$ 

$$H=egin{bmatrix} 6cos(x) & -3x^2sin(y)-cos(y) \ -3x^2sin(y)-cos(y) & xsin(y)-y^3cos(x) \end{bmatrix}$$

$$egin{aligned} egin{aligned} H = egin{bmatrix} 6xcos(y) & -3x^2sin(y)-cos(y) \ -3x^2sin(y)-cos(y) & xsin(y)-x^3cos(y) \end{bmatrix} \end{aligned}$$

Correct

$$H = egin{bmatrix} 6x^2cos(y) & -3x^2sin(y)-cos(x) \ -3x^2sin(y)-cos(y) & xsin(y)-xcos(y) \end{bmatrix}$$

$$H = egin{bmatrix} 6x^2cos(y) & -3x^2sin(y)-cos(x) \ -3x^2sin(y)-cos(y) & xsin(y)-xcos(y) \end{bmatrix} \ H = egin{bmatrix} 6cos(y) & -3x^2sin(y)-cos(y^2) \ -3x^2sin(y)-cos(y) & x^2sin(y)-x^3cos(y) \end{bmatrix}$$

5/5 points (100.00%)

Quiz, 5 questions

Calculate the Hessian for the function  $f(x, y, z) = xy + \sin(y)\sin(z) + z^3e^x.$ 

$$egin{aligned} egin{aligned} egin{aligned} egin{aligned} egin{aligned} egin{aligned} egin{aligned} egin{aligned} 3e^xz^2 & -1 & 3e^xz \ 1 & -sin(x^2)sin(z) & cos(y)cos(z) \ 3e^xz & cos(y)cos(z) & 6e^yz2-sin(y)sin(z) \end{aligned} \end{aligned}$$

$$H = egin{bmatrix} e^x z & cos(y)cos(z) & 6e^s z 2 - sin(y)sin(z) \ & H = egin{bmatrix} e^x z^3 & 1 & 3e^x z^2 \ 1 & -sin(y)sin(z) & cos(y)cos(z) \ 3e^x z^2 & cos(y)cos(z) & 6e^x z - sin(y)sin(z) \end{bmatrix}$$

#### Correct

$$H = egin{bmatrix} 2e^xz^3 & 1 & e^xz^2 \ 0 & -sin(x)sin(z) & cos(y)cos(z) \ 3e^xz^2 & cos(y)cos(z) & 6e^{2x} - sin(y)sin(x) \end{bmatrix}$$

$$H = egin{bmatrix} 2e^xz^3 & 1 & e^xz^2 \ 0 & -sin(x)sin(z) & cos(y)cos(z) \ 3e^xz^2 & cos(y)cos(z) & 6e^{2x} - sin(y)sin(x) \end{bmatrix} \ H = egin{bmatrix} -e^xz^3 & 0 & 3e^yz^2 \ 1 & sin(y)sin(z) & cos(y)cos(z) \ 3e^xz & cos(y)cos(z) & 6e^{-xz} - sin(y)sin(z) \end{bmatrix} \ \end{pmatrix}$$

5/5 points (100.00%)

Quiz, 5 questions

5.

Calculate the Hessian for the function  $f(x,y,z)=xycos(z)-sin(x)e^yz^3$  and evaluate at the point (x,y,z)=(0,0,0)

$$H = egin{bmatrix} 0 & 1 & 0 \ 0 & 0 & 0 \ 0 & 1 & 0 \end{bmatrix}$$

$$H = egin{bmatrix} 0 & 1 & 0 \ 1 & 0 & 0 \ 0 & 0 & 0 \end{bmatrix}$$

Correct

$$H = egin{bmatrix} 0 & 0 & 0 \ 1 & 0 & 0 \ 0 & 1 & 0 \end{bmatrix}$$

$$H = egin{bmatrix} 0 & 0 & 0 \ 1 & 0 & 1 \ 0 & 0 & 0 \end{bmatrix}$$



