## Congratulations! You passed!

Next Item



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  $(x,y,z)=(\pi,\pi,1)$ .

- $J(x, y, z) = (-2\pi, -e, 1)$
- $J(x, y, z) = (-2\pi, e, 0)$
- $J(x, y, z) = (-2\pi, -e, 0)$

Correct Well done!

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



2. Calculate the Jacobian of the vector valued functions:



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



Correct Well done!

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



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



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

Correct Well done!

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



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



- $H = \begin{bmatrix} -e^{x}z^{3} & 0 & 3e^{y}z^{2} \\ 1 & \sin(y)\sin(z) & \cos(y)\cos(z) \\ 3e^{x}z & \cos(y)\cos(z) & 6e^{-xz} \sin(y)\sin(z) \end{bmatrix}$
- $H = \begin{bmatrix} 3e^xz^2 & -1 & 3e^xz \\ 1 & -\sin(x^2)\sin(z) & \cos(y)\cos(z) \\ 3e^zz & \cos(y)\cos(z) & 6e^yz2 \sin(y)\sin(z) \end{bmatrix}$

Correct Well done!

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

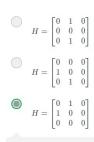


5 . Calculate the Hessian for the function  $f(x,y,z)=xycos(z)-sin(x)e^yz^3$  and evaluate at the point (x,y,z)=(0,0,0)









Correct Well done!



