## Congratulations! You passed!

Grade received 80% | Latest Submission Grade 80% | To pass 80% or higher

Go to next item

**1.** In this assessment, you will be tested on all of the different topics you have in covered this module. Good luck! **0 / 1 point**

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

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

**Incorrect**
Be careful when calculating partial derivatives.

**2.** Calculate the Jacobian of the vector valued functions: **1 / 1 point**

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

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

**Correct**
Well done!

**3.** Calculate the Hessian for the function $f(x,y) = x^3cos(y) - xsin(y)$. **1 / 1 point**

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

**Correct**
Well done!

**4.** Calculate the Hessian for the function $f(x,y,z) = xy + sin(y)sin(z) + z^3e^x$. **1 / 1 point**

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

**Correct**
Well done!

**5.** Calculate the Hessian for the function $f(x,y,z) = xycos(z) - sin(x)e^yz^3$ and evaluate at the point $(x,y,z) = (0,0,0)$ **1 / 1 point**

- $H = \begin{bmatrix} 0 & 0 & 0 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}$
- $H = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}$
- ◉ $H = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$
- $H = \begin{bmatrix} 0 & 0 & 0 \\ 1 & 0 & 1 \\ 0 & 0 & 0 \end{bmatrix}$

**Correct**
Well done!

Well done!