

MA2E01 Tutorial problems #2

(due at the end of your tutorial)

1. Find the equation of the plane that passes through the points

$$A(1, 2, 4), \quad B(1, -1, 0), \quad C(2, 3, 1).$$

2. Find the equation of the line through $(1, 2, 3)$ which is perpendicular to the line

$$x = 1 + t, \quad y = 2 - 3t, \quad z = 2t$$

and also parallel to the plane $2x - z = 1$. *Hint: if a line is parallel to a plane, then it is perpendicular to the normal vector of the plane.*

3. Sketch the level curves $f(x, y) = k$ in the case that $f(x, y) = x + y^2$ and $k = 0, 1, 2$. Use these level curves to draw a rough sketch of the graph of f .
4. Compute the partial derivatives f_x , f_y and f_{xy} in the case that $f(x, y) = y^2 e^{xy}$.