Answer on Question #68201 – Math – Calculus

Question

Find the curl of A=x2yi−2xzj+2yzk at the point (1, 0, 2).

Solution

$A = x^2yi - 2xzj + 2yzk.\ A_x = x^2y,\ A_y = -2xz,\ A_z = 2yz.$

$$Curl\ A = \begin{vmatrix} i & j & k \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ A_x & A_y & A_z \end{vmatrix} = \begin{vmatrix} i & j & k \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ x^2y & -2xz & 2yz \end{vmatrix} =$$

$$= (2z + 2x)i - (0 - 0)j + (-2z - x^2)k =$$

$$= (2z + 2x)i - (x^2 + 2z)k.$$

At the point $(1,0,2)$: $Curl\ A = 5i - 5k.$

Answer: $5i - 5k.$