

Lecture 23 Quiz

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$$1. \begin{vmatrix} \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ P & Q & R \end{vmatrix} = 0 \quad \text{field is conservative}$$

$$f_x = 3x^2y^3z^3 + yz$$

$$f(x, y, z) = x^3y^3z^3 + xyz + g(y, z)$$

$$f_y = 3x^3y^2z^3 + xz = 3x^3y^2z^3 + g_y(y, z)$$

$$g_y(y, z) = xz \rightarrow xyz$$

$$f_z = 3x^3y^3z^2 + xy = 3x^3y^3z^2 + h(z)$$

$$f(x, y, z) = x^3y^3z^3 + 2xyz$$

$$2. \int_C 5y dx + 10x dy$$

$$\frac{\partial}{\partial x} 10x = 10$$

$$\frac{\partial}{\partial y} 5y = 5$$

$$\iint 10 + 5 \, dA$$

$$\int \int 15 \, dx dy \rightarrow \boxed{15}$$