

$$\operatorname{div} F = \frac{dP}{dX} + \frac{dQ}{dY} + \frac{dR}{dZ}$$

$$\operatorname{div} F = \frac{d}{dX}(P) + \frac{d}{dY}(Q) + \frac{d}{dZ}(R)$$

$$P = 2x - z \quad Q = 2y \quad R = xz$$

$$\operatorname{div} F = \frac{d}{dx}(2x - z) + \frac{d}{dy}(2y) + \frac{d}{dz}(xz) = \frac{d}{dx}(2x) - \frac{d}{dx}z + \frac{d}{dy}(2y) + \frac{d}{dz}(xz) = 2 - 0 + 2 + x = 4 + x$$

второе задание

$$\operatorname{rot} F = \left(\frac{dF_z}{dy} - \frac{dF_y}{dz} \right) i + \left(\frac{dF_x}{dz} - \frac{dF_z}{dx} \right) j + \left(\frac{dF_y}{dx} - \frac{dF_x}{dy} \right) k$$

$$\text{где } F = (2x - yz)i + yj - xzk \text{ потому } \begin{aligned} F_x &= 2x - yz \\ F_y &= y \\ F_z &= xz \end{aligned}$$

$$\operatorname{rot} F = \left(\frac{d(xz)}{dy} - \frac{dy}{dz} \right) i + \left(\frac{d(2x - yz)}{dz} - \frac{d(xz)}{dx} \right) j + \left(\frac{dy}{dx} - \frac{d(2x - yz)}{dy} \right) k =$$

$$(0 - 0)i + \left(\frac{d(2x)}{dz} - \frac{d(yz)}{dz} - z \right) j + \left(0 - \frac{d(2x)}{dy} + \frac{d(yz)}{dy} \right) k = 0i + (0 - z - z)j + (0 + z)k = \mathbf{0i - 2zj + zk} = [0, -2z, z]$$