

### Answer on Question #56123 – Math – Calculus

Given that

$$\varphi = 2x^2y - xz^3$$

find

$$\nabla^2 \varphi$$

$$2y - 6xz$$

$$4y - 6xz$$

$$2y - xz$$

$$y + 6xz$$

### Solution

$$\varphi = 2x^2y - xz^3$$

$$\nabla^2 \varphi = 2\nabla \varphi = 2 \left\langle \frac{\partial \varphi}{\partial x}, \frac{\partial \varphi}{\partial y}, \frac{\partial \varphi}{\partial z} \right\rangle = 2 \langle 4xy - z^3, 2x^2, -3xz^2 \rangle =$$

$$= \langle 8xy - 2z^2, 4x^2, -6xz^2 \rangle.$$