TUGAS TURUNAN PARSIAL

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1 Find all first and second partial derivatives of the following:

(a) $z = 4x^3 - 5xy^2 + 3y^3$

(b) $z = \cos(2x + 3y)$

(c) $z = e^{x^2 - y^2}$

(d) $z = x^2 \sin(2x + 3y)$

2 (a) If $V = x^2 + y^2 + z^2$, express in its simplest form

$$x\frac{\partial V}{\partial x} + y\frac{\partial V}{\partial y} + z\frac{\partial V}{\partial z}.$$

(b) If $\phi(x, y) = x^3y + e^{xy^2}$, find (a) ϕ_x, (b) $\phi_{y\,\phi xx}$, (d) ϕ_{yy}, (e) ϕ_{xy}, and (f) ϕ_{yx}.

3 The power P dissipated in a resistor is given by $P = \frac{E^2}{R}$.

If $E = 200$ volts and $R = 8$ ohms, find the change in P resulting from a drop of 5 volts in E and an increase of 0·2 ohm in R.

4 If $\theta = kHLV^{-\frac{1}{2}}$, where k is a constant, and there are possible errors of ± 1 per cent in measuring H, L and V, find the maximum possible error in the calculated value of θ.