

Subject _____

موضوع الدرس

Date: / /

الموافق

/ /

التاريخ

$$z = \frac{1}{2x} \frac{\partial z}{\partial x} x^2 + \frac{1}{2y} \frac{\partial z}{\partial y} y^2 \quad] \times 2$$

$$2z = \frac{\partial z}{\partial x} x + \frac{\partial z}{\partial y} y$$

ex ③ $z = ax + by + cxy$ رُفِعْنَا

$$z_x = a + cy \Rightarrow a = z_x - cy$$

$$z_y = b + cx \Rightarrow b = z_y - cx$$

$$z_{xy} = c$$

$$z = (z_x - cy)x + (z_y - cx)y + z_{xy} xy$$

ex ④ $2z = \frac{x^2}{a} + \frac{y^2}{b}$ Formation of p.d.f?

$$2 \frac{\partial z}{\partial x} = \frac{2x}{a} \Rightarrow \frac{2z}{x} p = \frac{2x}{za} \quad] \times 2$$

$$a = \frac{x}{p}$$

$$2 \frac{\partial z}{\partial y} = \frac{2y}{b} \Rightarrow \frac{2z}{y} q = \frac{2y}{zb} \quad] \times 2$$

$$q = \frac{y}{b} \Rightarrow b = \frac{y}{q}$$

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$$2z = \frac{x^2}{\left(\frac{x}{p}\right)} + \frac{y^2}{\left(\frac{y}{q}\right)}$$

المعلومة من فوق تكون
المشتقة بالمقام و هي
موجودة (q, p)
مقام المقام في اولى ذيل

$$2z = px + qy$$

ex ⑤ $z = ax^2 + bxy + cy^2$ Formation of p.D.E ?
واجب الحراب

$$\frac{\partial z}{\partial x} = 2ax + by \Rightarrow p = 2ax + by$$

$$\frac{\partial z}{\partial y} = bx + 2cy \Rightarrow q = bx + 2cy$$

$$\Rightarrow z_{xx} = 2a \Rightarrow a = \frac{z_{xx}}{2}$$

$$\Rightarrow z_{yy} = 2c \Rightarrow c = \frac{z_{yy}}{2}$$

$$\Rightarrow z_{xy} = b$$

$$z = \frac{1}{2} \frac{\partial^2 z}{\partial x^2} x^2 + \frac{\partial z}{\partial x \partial y} xy + \frac{1}{2} \frac{\partial^2 z}{\partial y^2} y^2$$