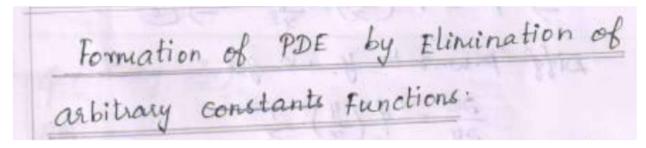




TOPIC: 2 - FORMATION OF PARTIAL DIFFERENTIAL EQUATIONS



$$\varphi(u,u)=0 \Rightarrow \left| \frac{\partial u}{\partial x} \frac{\partial u}{\partial x} \right| = 0.$$

Fliminate the aebituary function of from
$$x = b\left(\frac{4}{\alpha}\right)$$
 form a PDE. Sol:

Given $z = f\left(\frac{4}{\alpha}\right)$

Diff p.w. $x \cdot b = x$, we get

$$\frac{\partial z}{\partial x} = f'\left(\frac{4}{\alpha}\right) \cdot \frac{-y}{x^2}$$

$$\Rightarrow p = f'\left(\frac{4}{\alpha}\right) \cdot \frac{-y}{x^2} \Rightarrow 0$$

Diff p.w. $x \cdot b = y$, we get
$$\frac{\partial z}{\partial y} = f'\left(\frac{4}{\alpha}\right) \cdot \frac{1}{x}$$

$$\frac{\partial z}{\partial y} = f'\left(\frac{4}{\alpha}\right) \cdot \frac{1}{x}$$

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

$$\frac{\partial z}{\partial y} = -\frac{y}{x^2} \cdot \frac{x}{x}$$

$$\frac{\partial z}{\partial y} = -\frac{y}{x}$$





2 =
$$f(xy)$$

Sol:

 $z = f(xy)$
 $z = f(xy)$





$$\frac{\partial z}{\partial z} - y \qquad \frac{z - x + z}{z^2} = 0$$

$$\frac{\partial z}{\partial z} - y - \frac{\partial z}{\partial z^2} = 0$$

$$\frac{1}{z^2} \left[-\frac{2z}{2z} + \frac{2z}{2z} - \frac{2z}{2z} - \frac{2z}{2z} + \frac{2z}{2z} + \frac{2z}{2z} + \frac{2z}{2z} + \frac{2z}{2z} + \frac{2z}{2z} - \frac{2z}{2z} + \frac{2z}{2z} + \frac{2z}{2z} + \frac{2z}{2z} - \frac{2z}{2z} + \frac{2z}{2z} + \frac{2z}{2z} - \frac{2z}{2z} + \frac{2z}{2z} - \frac{2z}{2z} + \frac{2z}{2z} - \frac{2z}{2z} - \frac{2z}{2z} - \frac{2z}{2z} - \frac{2z}{2z} + \frac{2z}{2z} - \frac{2z}{$$





5.
$$z = xf(2x+y) + g(2x+y)$$

Sol:

 $z = xf(2x+y) + g(2x+y)$

Diff p. w. 7. to x.

 $p = \frac{\partial z}{\partial x} = f(2x+y) + xf'(2x+y) \cdot 2 + g'(2x+y) \cdot 2$
 $q = xf'(2x+y) + g'(2x+y) - 2$
 $z = f'(2x+y) \cdot 2 + xf''(2x+y) \cdot 4 + f'(2x+y) \cdot 2$
 $z = f'(2x+y) \cdot 4 + xf''(2x+y) \cdot 4 + f'(2x+y) \cdot 2$
 $z = f'(2x+y) + xf''(2x+y) + 2g''(2x+y) \cdot 3$
 $z = f'(2x+y) + xf''(2x+y) + 2g''(2x+y) \cdot 3$
 $z = f'(2x+y) + xf''(2x+y) + xf''(2x+y) \cdot 3$
 $z = xf''(2x+y) + xf''(2x+y) + yf''(2x+y) \cdot 3$
 $z = xf''(2x+y) + xf''(2x+y) \cdot 3$
 $z = xf''(2x+y) \cdot 4 \cdot 3$
 $z = xf'''(2x+y) \cdot$





(a) From the p de by elinariting of from
$$Q = \frac{1}{2} + \frac{1}{2} +$$