

Assignment**I. Solve the following PDEs:**

$$1. (2D_x^2 - 5D_x D_y + 2D_y^2)z = 5 \sin(2x + y)$$

$$2. (4r + 12s + 9t) = e^{3x-2y}$$

$$3. (D_x^3 + D_x^2 D_y - D_x D_y^2 - D_y^3)z = e^x \cos 2y$$

$$4. (D_x^2 - 4D_x D_y + 4D_y^2)z = e^{2x+y}$$

Answers:

$$1. z = f_1\left(y + \frac{1}{2}x\right) + f_2(y + 2x) - \frac{10}{3}x \cos(y + 2x)$$

$$2. z = f_1\left(y - \frac{3}{x}x\right) + xf_2\left(y - \frac{3}{2}x\right)$$

$$3. z = f_1(y - x) + xf_2(y - x) + f_3(y + x) + \frac{1}{25}e^x \cos 2y + \frac{2}{25}e^x \sin 2y$$

$$4. z = f_1(y + 2x) + xf_2(y + 2x) + \frac{1}{2}x^2 e^{2x+y}$$