

Coursework 1 Solutions

PS 1: 3(3)

[10 points]

$u_x + e^y u_y = 0$ is a
linear homogeneous equation

PS 1: 5

[10 points]

$$u_x = f'(x) g(y)$$

$$u_y = f(x) g'(y)$$

$$u_{xy} = f'(x) g'(y)$$

$$\begin{aligned} \text{So } u \cdot u_{xy} &= f(x) f(y) \cdot f'(x) g'(y) \\ &= f'(x) g(y) \cdot f(x) g'(y) \\ &= u_x \cdot u_y \end{aligned}$$