

Correction to Solution of Problem # 9 part c) In Practice final.

Following the argument in page 254 of Solsa's book we find that for

$$\begin{aligned} \phi_{\xi}(x,t) &= \xi & \psi(x,t) &= \eta & \text{we have } \begin{cases} t^{\frac{3}{2}} = \frac{\xi - \eta}{4} \\ x = \frac{\xi + \eta}{6} \end{cases} \\ \parallel & & \parallel & & \\ 3x + 2t^{\frac{3}{2}} & & 3x - 2t^{\frac{3}{2}} & & \Rightarrow \end{aligned}$$

$$\text{Also } \phi_t = 3t^{\frac{1}{2}} \quad \phi_{tt} = \frac{3}{2}t^{-\frac{1}{2}}$$

$$\phi_x = 3 \quad \phi_{xx} = 0$$

$$\psi_t = -3t^{\frac{1}{2}} \quad \psi_{tt} = -\frac{3}{2}t^{-\frac{1}{2}} \quad \text{and so}$$

$$A = 0 \quad C = 0 \quad B = -18t \quad D = \frac{3}{2}t^{-\frac{1}{2}} = -E$$

So the canonical equation is

$$-36tU + \frac{3}{2}t^{-\frac{1}{2}}U_{\xi} - \frac{3}{2}t^{-\frac{1}{2}}U_{\eta} = 0 \quad \text{or}$$

$$U_{\xi\eta} = \frac{1}{18(\xi - \eta)} [U_{\xi} - U_{\eta}]$$

This is too complicated to find solutions. So do not worry about.