

Exercise 4

If $u(x, t)$ satisfies the wave equation $u_{tt} = u_{xx}$, prove the identity

$$u(x + h, t + k) + u(x - h, t - k) = u(x + k, t + h) + u(x - k, t - h)$$

for all x, t, h , and k . Sketch the quadrilateral Q whose vertices are the arguments in the identity.