

### Exercise 1.3.2

Two one-dimensional rods of different materials joined at  $x = x_0$  are said to be in **perfect thermal contact** if the temperature is continuous at  $x = x_0$ :

$$u(x_0-, t) = u(x_0+, t)$$

and no heat energy is lost at  $x = x_0$  (i.e., the heat energy flowing out of one flows into the other). What mathematical equation represents the latter condition at  $x = x_0$ ? Under what special condition is  $\partial u / \partial x$  continuous at  $x = x_0$ ?