

Let f be an increasing function defined on $[a, b]$. Show that for any $r < s$ the set

$$E_{rs} = \{x \in [a, b] : D^+f(x) < r < s < D_-f(x)\}$$

has outer measure zero. [This is one of the four cases comprising the proof that $f'(x)$ exists a.e. One was done in lecture and another is given by Royden, p. 100.]