

## HW 3-8

① Let  $a < c < b$  be real numbers,  $f: (a, b) \rightarrow \mathbb{R}$  an increasing function and

$$l = \sup_{(a, c)} f, \quad r = \inf_{(c, b)} f.$$

Prove that  $f$  is continuous at  $c$  if and only if  $l = r$ .

② If  $\varphi, \psi: A \rightarrow \mathbb{R}$  are increasing functions, does it follow that  $\varphi + \psi$  is increasing? That  $\varphi\psi$  is increasing?

③ Should some of the answers in ② turn out to be "no", can you salvage the statement by adding extra assumptions?