

Exercises

E15.1 [1BF] Prerequisites: convex functions. Let $I \subset \mathbb{R}$ be an open interval, and $x_0 \in I$. Prove that these two facts are equivalent:

(a) $F : I \rightarrow \mathbb{R}$ is convex.

(b) There exists $f : I \rightarrow \mathbb{R}$ monotonic (weakly) increasing, and such that $F(x) = F(x_0) + \int_{x_0}^x f(s) \, ds$,

and verify that you can choose f be the right (or left) derivative of F .