Assignment 7 (10/12)

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Problem 0

Suppose f is a real valued continuous function on $[2, 7]$. Prove that given positive real numbers a and b, there exists a value $c \in [2, 7]$ such that

$$f(c) = \frac{2f(2) + 3f(7)}{5}$$

Problem 1

Problems $5.2.12a$.

Problem 2

Note that a regular partition is one where the lengths of the subintervals $[x_i, x_{i+1}]$ are equal for all $i,\ 0 \leq i < n$.

For a partition $P = \{x_0, x_1, \ldots, x_n\}$ of $[a, b]$, we define the *norm* of P to be

$$\|P\| = \max_{0 \leq i \leq n-1} (x_{i+1} - x_i)$$

Thus the norm of a partition is the naximum length of a subinterval obtained by the partition.

Now assuming the result of problem $5.2.35$, do problems $37(a, b, c)$.

Problem 3

Give a rigorous proof of theorem $5.3.1$ for a function f which is positive everywhere.