1. (Textbook questions): 18.1, 18.2, 18.3, 18.6 (Hint: You may use Theorem 18.2 in your textbook.)

18.1) Show that if the function $-f$ assumes its maximum at $x_0 \in [a,b]$, then $f$ assumes its minimum at $x_0$.

**Answer:** We have that $-f$ assumes its maximum at $x_0$. This means that for all $x \in [a,b]$, we have $-f(x) \leq -f(x_0)$. Thus $f(x) \geq f(x_0)$ for all $x \in [a,b]$. This means exactly that $f$ assumes its minimum at $x_0$.

18.2) The proof breaks down at the assertion that $x_0$ (which is defined as the limit of the convergent subsequence of $(x_n)$) is in the interval $(a,b)$. Indeed, we would only know that this point is in the closed interval $[a,b]$. (This is using the general fact that if $\{s_n\}$ is a convergent sequence with $a < s_n < b$, then $a \leq \lim_{n \to \infty} s_n \leq b$.)

18.3) See book.

18.6) Prove that $x = \cos(x)$ for some $x$ in $(0, \pi/2)$.

**Answer:** Consider the function $f(x) = \cos(x) - x$ which is a continuous function since both $\cos(x)$ and $x$ are continuous. Then $f(0) = 1$ and $f(\pi/2) = -\pi/2$. Thus, by the Intermediate Value theorem, we have that there is some $c \in (0, \pi/2)$ such that $f(c) = 0$. This means exactly that $\cos(x) = x$ has a solution in this interval.