Some remarks on the mandatory assignment:

- Sets of the form $U \times V$ are open in $X \times Y$, for $U \subseteq X$, $V \subseteq Y$ open subsets. However, not all open sets in $X \times Y$ are on this form. Still it suffices to check continuity of functions $Z \to X \times Y$ on sets of the form $U \times V$. You should know why.

- In exercise 1 you can save yourself (and me) a lot of time by using Theorem 19.6.

- In exercise 2d, $f(nx) = nf(x)$ must be treated as a special case for an integer $n < 0$.

- In exercise 2d it would be nice if you specified that $c = f(1)$. This was not so clear in all the solutions.

  Curiously there were three different solutions. The most common approach was to prove that $f|_{\mathbb{Q}} = f(1) \cdot \mathrm{id}_{\mathbb{Q}}$, and use part c. Another approach was to use that $\mathbb{Q}$ is dense in $\mathbb{R}$ directly, and that limits commute with continuous functions. A third approach was to prove that f is differentiable and use the fundamental theorem of calculus.

- In exercise 3b the best model for the projective plane is likely $\mathbb{P}^2 = S^2/(x \sim -x)$, see page 372.