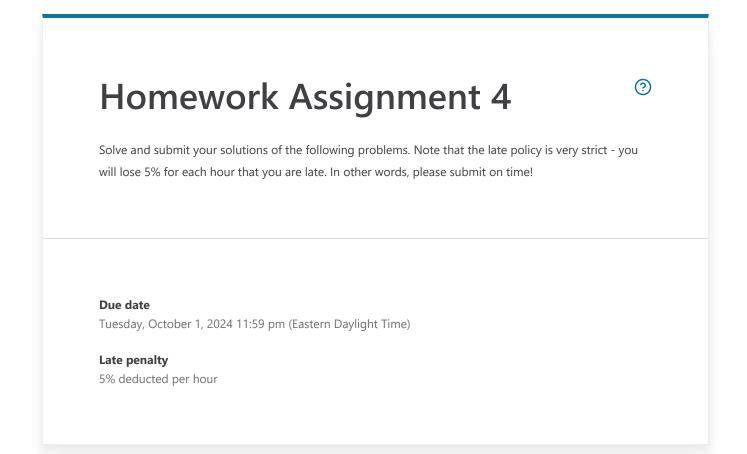
This is a preview of what students will see when they are submitting the assignment. Interactive features are disabled.



Q1 (0 points)

Read sections 17 through 20 in Munkres' textbook (Topology, 2nd edition). Remember that reading math isn't like reading a novel! If you read a novel and miss a few details most likely you'll still understand the novel. But if you miss a few details in a math text, often you'll miss everything that follows. So reading math takes reading and rereading and rereading and a lot of thought about what you've read. Also, preread sections 22 through 24, just to get a feel for the future.

In addition to the problems below, solve but do not submit your solutions of problems 6, 8, 14, and 19abc on pages 101-102 of Munkres' book, and also problems 7 and 9 on page 111-112.

Q2 (10 points)

(Munkres pp 101 ex 13)

Show that a topological space X is Hausdorff iff the diagonal $\Delta=\{(x,x)\colon x\in X\}$ is closed in X imes X.

Q3 (10 points)

(Munkres pp 103 ex 19d)

If U is an open set, is it true that $U = \operatorname{Int} \bar{U}$?

Note that in math classes a yes/no question is never just a yes/no question. You are always expected to prove or give a counterexample.

Q4 (10 points)

(Munkres pp 111-112 ex 8)

Let Y be an ordered set taken with the order topology, and assume $f,g{:}\,X o Y$ are continuous.

(a) Sow that the set $\{x: f(x) \leq g(x)\}$ is closed in X.

(b) Let $h(x):=\max(f(x),g(x)).$ Show that h is a continuous function.

Q5 (10 points)

Show that if X is a Hausdorff space and if x_1, \ldots, x_n are distinct points of X, then there exist open sets U_1, \ldots, U_n in X such that for every $i, x_i \in U_i$ and such that if $i \neq j$, then $U_i \cap U_j = \emptyset$.

