Problem set 5 (optional) The purpose of this problem set is to help you make up for any one of the required problem sets that you "bombed" (i.e., that you received a grade lower than 70 on). Here's the procedure:

Select one or more rows of the following diagram. Fill in each square of that row with + (for "yes") or - (for "no"). For each row filled in correctly, I will add 6 points to the score of whichever of your problem sets has the lowest score (up to a maximum of 70 points for that problem set). The same rules as usualno collaboration, please. Entries may be submitted before or at the final exam. Decisions of the judges will be final. No box tops needed to enter!

For the first six rows of the diagram, the question is this: "Is the given property satisnied by the given space?" For the last three rows, it is: "Is the given property preserved by the given operation?"

| - | $\begin{array}{r} \text { O } \\ \text { o } \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array}$ |  | 䔍 |  |  |  |  | First-countable |  | $\begin{aligned} & =\frac{0}{9} \\ & \text { 呂 } \\ & \text { an } \end{aligned}$ |  | Locally metrizable |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $S_{\Omega}$ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| The ordered square |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $\mathbb{R}_{R} \times \mathbb{R}_{R}$ |  |  |  |  | . |  |  |  |  |  |  |  |  |  |
| $\mathbb{R}^{\omega}$ in uniform topology |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| $\mathbb{R I}^{I}$ in product topology |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| An arbitrary metric space |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Taking countable products |  |  |  |  |  |  |  | . |  |  |  |  |  |  |
| Taking a closed subspace |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Taking an open subspace |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

