MTH 437/537 **HW #1** Spring 1999

(The following quote and problem are from **Spacetime Physics** by Taylor & Wheeler.)
WHEELER'S FIRST MORAL PRINCIPLE: *Never make a calculation until you know the answer.*

1. **THE POLE AND BARN PARADOX**

Consider a 20 meter pole carried so fast in the direction of its length that it appears to be only 10 meters long in the laboratory frame of reference. Therefore, at some instant the pole can be entirely enclosed in a barn 10 meters long! However, from the frame of reference of the runner carrying the pole the barn appears to be contracted to half its length, i.e. 5 meters. How can a 20 meter pole fit into a 5 meter barn?

Provide a clear resolution of this "paradox". You may wish to consider what happens if the barn doors (one at each end) are closed ("at the same time") while the pole is "inside" the barn. Does this catch the pole inside the barn?

Some further paradoxes can be found on the course home page.
You may choose to resolve one of those paradoxes instead of this one.