Show your steps — step by step. Note that when you *use* a for all, the statement you get is slightly smaller. (So, if you *use* statement of the form for all ... if ... then ... the new thing you get will be of the form if ... then ...) For the 5th question, I used a LaTeX thing called text, but to do this, I added the amsmath package at the top.

1. Prove the following by contradiction: If the Minesweeper configuration is as given in Figure 3.2, then Cell B is safe. (Figure 3.2 is found in the handbook at the top of page 69. The number 69 is printed in the corner of the page, though it is the 79th page of the PDF file, due to table of contents, cover page, etc.)

2. Prove the following by cases: If the Minesweeper configuration is as given in Figure 3.2, then Cell V is a mine. [Hint: start where Cells P, Q, and R are and create three cases.]

3. Prove: for all $a \in \mathbb{Z}$, for all $b \in \mathbb{Z}$, if $a + b$ is even, then $a - b$ is even.

4. Prove: for all $c \in \mathbb{Z}$, we have c is even if and only if $c - 1$ is odd.

5. Use the hypotheses:

- H1: Every element of D is an element of A.
- H2: For all $d \in D$, if d raises tigers, then d does not play soccer.
- H3: Every element of B is an element of D.
- H4: Every element of S is an element of T.
- H5: For all $b \in B$, if b is a paramedic, then b plays board games.
- H6: Every element of U is an element of D.
- H7: For all $a \in A$, if a does not raise tigers, then a is a paramedic.

and the definitions of these sets

- $S = \{x \in D : x \text{ plays board games}\}$
- $T = \{c \in U : c \text{ is a barista}\}$

to prove: for all $b \in B$, if b plays soccer, then b is a barista.