1. Show that a bounded set $\underset{=}{S} \subset R$, $x \in S$, $|x| < M$, has $\sup_{x \in S} x$.

2. The space of all real numbers is the completion of all rational numbers.
($R^1 = Q^*$).

Hint from my professors.
Let Q_{10} be the space of finite decimal fractions.
$Q_{10} = \left\{ \frac{m}{10^N} \right\}$ $m \in \mathbb{Z}$ $\Longleftrightarrow$ $q = \sum_{n=M}^{N} a_n 10^{-n}$

a_M: $\cdots a_{-1} \,.\, a_1 a_2 a_3 \cdots a_N$
a_{M+1}: $\vdots$ $\vdots$
$.\, a_1 a_2 a_3 a_4\ a_N a_{N+1}$

*Q3. The set of all points $(x = x_1, x_2, \cdots, x_n)$ with rational coordinates is dense in R^n.
(Please see the example 3 on page 48 in my reference-6 pdf file.)
$[Q] = R$

*Q4. P. 49 in my reference-6 pdf.
Example 7. The end of the fifth line says that "the distance b/w any two points of E equals 1." ~~So expla~~ why is it equal to 1?
Please explain.

*Q5. Given set M, Let $M \subset B$. B is closed.
Show that $B \supset \overline{M}$. ($\overline{M}$ is the set of all contact points of M)
$\overline{M} = [M]$.