

Homework #3 (Due January 31).

- Read pp. 21-25 in the textbook.
- Need to know: Statements and proofs of Propositions 3.1, 3.2, 3.3, 3.4 and 3.5.

• Do the following problems:

1. Let a, b, c, d be rational numbers and x be an irrational number.

a) Show that if $a + bx = c + dx$, then $a = c$ and $b = d$.

b) Show that if the number $\frac{a+2x}{b+x}$ is rational, then $a = 2b$.

2. a) Express $\frac{3}{11}$ as a decimal.

b) Express $2.\overline{142}$ as a fraction.

3. Prove that between any two distinct real numbers one can find as many distinct rational numbers as one wants.

4. Is the number $.2020002000200002\dots$ rational or irrational? Please explain.