

Algebra 2 Homework 5

March 18, 2024

Solution of problem 1: □

Solution of problem 2: □

Solution of problem 3: □

Solution of problem 4: □

Solution of problem 5: We know that $x_n \xrightarrow{w} x$, so for any $f \in X^*$, we have $f(x_n) \rightarrow f(x)$. Using the Hahn-Banach theorem, we can find a linear functional f where $\|f\| = 1$, and $f(x) = \|x\|$. Then we have

$$|f(x_n - x)| \leq \|f\| \cdot \|x_n - x\| = \|x_n - x\|.$$

□

Solution of problem 6: □