

Problem 1. Lemma 3.1.2 items (i) and (ii).

Problem 2. Lemma 3.1.2 items (iii) and (iv).

Problem 3. Let $A \subset \mathbb{R}$ and $f : A \rightarrow \mathbb{R}$. Prove or disprove that

$$\omega_f(ch) \leq c\omega_f(h) \quad \forall c, h > 0.$$

Problem 4. Let $A \subset \mathbb{R}$ and $f, g : A \rightarrow \mathbb{R}$. Show that

$$\omega_{af+bg} \leq |a|\omega_f + |b|\omega_g \quad \forall a, b \in \mathbb{R}.$$

Give an example of $a, b \in \mathbb{R}$, $f, g : A \rightarrow \mathbb{R}$ such that the equality is not satisfied, i.e.,

$$\omega_{af+bg} < |a|\omega_f + |b|\omega_g.$$