

2.2 a) $x^2 > 2 \Leftrightarrow 0 < x^2 - 2 = (x - \sqrt{2})(x + \sqrt{2})$

$\Leftrightarrow (x - \sqrt{2} > 0 \text{ and } x + \sqrt{2} > 0)$

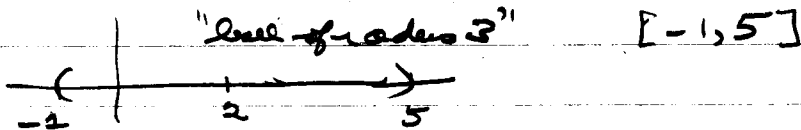
or $(x - \sqrt{2} < 0 \text{ and } x + \sqrt{2} < 0)$

$\Leftrightarrow x > \sqrt{2} \text{ or } x < -\sqrt{2}$ (because $x > \sqrt{2} \Rightarrow x > -\sqrt{2}$ etc.)

answer $(-\infty, -\sqrt{2}) \cup (\sqrt{2}, \infty)$

b) $|x| \leq 3 \Leftrightarrow -3 \leq x \leq 3$ $[-3, 3]$

c) $|x-2| \leq 3 \Leftrightarrow$



(corrected!)

d) $(-1, 1) \cap \mathbb{Q}$

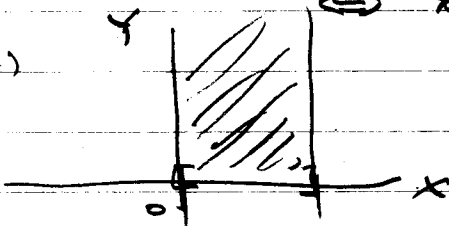
2.4 $x \in A \setminus (B \cup C) \Leftrightarrow x \in A \text{ and } x \notin B \cup C$ (i.e. $(x \notin B \text{ or } x \notin C)$)

$\Leftrightarrow x \in A \text{ and } (x \notin B \text{ and } x \notin C)$

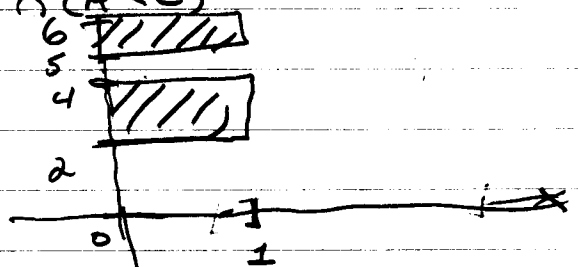
$\Leftrightarrow (x \in A \text{ and } x \notin B) \text{ and } (x \in A \text{ and } x \notin C)$

$\Leftrightarrow x \in (A \setminus B) \cap (A \setminus C)$

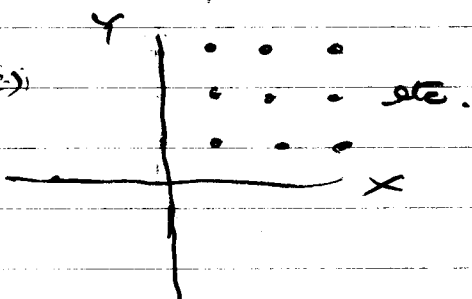
2.5. a)



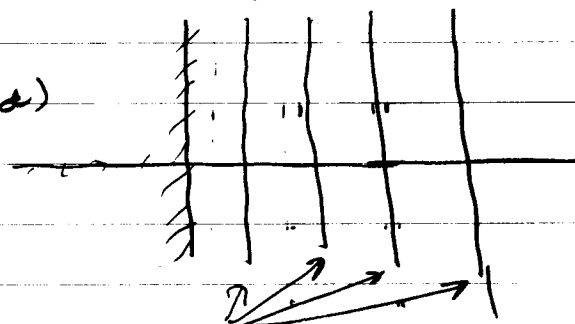
b)



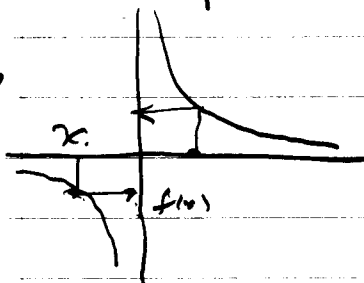
c)



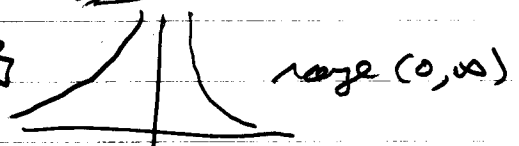
d)



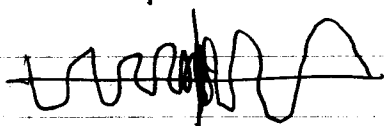
2.7



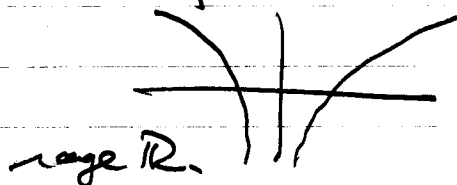
range $\mathbb{R} \setminus \{0\}$



range $(0, \infty)$



range $[-1, 1]$



range \mathbb{R} .