1.a

$$\|x\|_1 = \sum_{i=1}^{n} |x_i|$$

$$\|x\|_1 \geq 0 \text{ FOR } x \in \mathbb{R}^n \text{ & } \|x\|_1 = 0 \text{ IFF } x = 0$$

$$\sum_{i=1}^{n} |x_i| = |x_1| + |x_2| + |x_3| + \cdots + |x_n| \geq 0 \text{ FOR } x \in \mathbb{R}^n$$

$$\text{& } \|x\|_1 = 0 \text{ IFF } x = 0 \quad \therefore$$

1.b

$$\|\lambda x\|_1 = |\lambda| \|x\|_1 \text{ FOR } \lambda \in \mathbb{R} \text{ & } x \in \mathbb{R}^n$$

$$\|\lambda x\|_1 = \sum_{i=1}^{n} |\lambda x_i| = |\lambda x_1| + |\lambda x_2| + \cdots + |\lambda x_3| = \cdots$$

$$\cdots = \lambda \left(|x_1| + |x_2| + \cdots + |x_3| \right) = |\lambda| \|x\|_1 \quad \therefore$$