1. Write each of the following in as simple a way as possible:

   (a) $(5, 10) - [6, 12]$

   (b) $[5, 10] - [6, 12]$

   Circle T or F for each of the following statements:

   (c) $0 \subseteq \{0, 1, 2\}$ T   F

   (d) $0 \in \{0, 1, 2\}$ T   F

   (e) $\{0\} \in \{0, 1, 2\}$ T   F

2. (a) What is $\displaystyle\bigcap_{n\in\{1,2,3\}} \left[-\frac{1}{n}, \frac{1}{n}\right]$?

(b) What is $\displaystyle\bigcup_{n\in\{1,2,3\}} \left[-\frac{1}{n}, \frac{1}{n}\right]$?

(c) What is $\displaystyle\bigcap_{n\in\mathbb{Z}^+} \left[-\frac{1}{n}, \frac{1}{n}\right]$?

(d) What is $\displaystyle\bigcup_{n\in\mathbb{Z}^+} \left[-\frac{1}{n}, \frac{1}{n}\right]$?

3. $\left(\bigcap_{i \in I} B_i \right)' = \bigcup_{i \in I} B'_i.$

4. $\forall r \in \mathbb{R}, r > 1 \Rightarrow r > \dfrac{1}{r} > \dfrac{1}{r^2}$

5. $\forall x, y \in \mathbb{R}, |x| \leq y \Rightarrow -y \leq x \leq y.$