NOTE: ALL ANSWERS TEMPORARY AND NOT CHECKED

Question 1: (Section 2.3, #2b) $B = \{ -\pi^x \mid x \leq 0 \}$.

Question 2: (Section 2.3, #5)

(a) $S = \{ x \in \mathbf{Z} \mid x \geq 5 \}$.

(b) $S = \{ 2x + 1 \mid x \in \mathbf{Z} \}$.

(c) $S = \{ x \in \mathbf{Q} \mid x > 0 \}$.

(d) $S = \{ x \in \mathbf{R} \mid 1 < x < 7 \}$.

(e) $S = \{ x \in \mathbf{R} \mid x^2 > 0 \}$.

Question 3: (Section 5.3, #2)

Proof. In order to prove equality, we show that $A \cup (B \cap C) \subseteq (A \cap B) \cup (A \cap C)$ and $(A \cap B) \cup (A \cap C) \subseteq A \cup (B \cap C)$.

($\rightarrow$) Suppose x is an arbitrary element in $A \cap (B \cup C)$. Then, $x \in A \wedge (x \in B \vee x \in C)$. By the distributive property of conjunctions and disjunctions, $(x \in A \wedge x \in B) \vee (x \in A \vee x \in C)$. By the definition of

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