Math 156: Workshop 6

Write your solutions neatly, or else points will be deducted. Prove the following.

1. (p.155 #2) Suppose $x \in \mathbb{Z}$. Then x is odd if and only if $3x + 6$ is odd.

2. (p.155 #6) Suppose $x, y \in \mathbb{R}$. Then $x^3 + x^2y = y^2 + xy$ if and only if $y = x^2$ or $y = -x$.

3. Let $S = \{a\pi + b : a, b \in \mathbb{Q}\}$. For any $x \in S$, there is a unique pair $(a, b) \in \mathbb{Q}$ such that $x = a\pi + b$.

4. The equation $x^7 + 6x + 4 = 0$ has exactly one real solution (i.e., a unique root) on the interval $(-1, 0)$.

5. (p.171 #6) If A, B, C are sets and $A \subseteq B$, then $A - C \subseteq B - C$.

6. (p.171 # 16) If A, B, C are sets, then $A \times (B \cup C) = (A \times B) \cup (A \times C)$.