Drill problems 1.

Problem 1. Find the sets $A \cap B$, $A \cup B$, $A \setminus B$, $A \Delta B$, where

a. $A = \{1, 3, 7\}$, $B = \{2, 3, 5\}$,
b. $A = \{4, 6\}$, $B = \{4, 6\}$,
c. $A = \emptyset$, $B = \{2, 4\}$,
d. $A = \{2, 4\}$, $B = \emptyset$,
e. $A = \mathbb{N}$, $B = \{2, 4, 6, 8, ...\}$,
f. $A = \{1, 3, 5, 7, ...\}$, $B = \mathbb{N}$,
g. $A = \{\emptyset, \{1\}\}$, $B = \{1\}$.

Problem 2. Find the power set $\mathcal{P}(A)$, where

a. $A = \{x, y, z\}$,
b. $A = \emptyset$.

Problem 3. Let P, Q, R be statements. Write truth tables for

a. $P_1 = (P$ and $(Q$ or $R))$,
b. $P_2 = ((P$ and $Q)$ or $R)$,
c. $P_3 = (P$ or $(Q$ and $R))$,
d. $P_4 = ((P$ or $Q)$ and $R)$,
e. $P_5 = ((P$ and $Q)$ or $(P$ and $R))$,
f. $P_6 = ((P$ or $Q)$ and $(Q$ or $R))$,
g. $P_7 = ($not $(P$ or $Q))$,
h. $P_8 = ((\text{not } P)$ and $(\text{not } Q))$,
i. $P_9 = ((P \Rightarrow (\text{not } Q)) \Rightarrow R)$,
j. $P_{10} = (P \Rightarrow ((\text{not } Q) \Rightarrow R))$.

What statements are equal to each other?