Deduction

André has a black suit and a tweed suit. He always wears his tweed suit OR he wears sandals. If he wears his tweed suit and purple shirt, he does not wear a bow tie. He never wears his tweed suit unless he also wears a purple shirt OR sandals. If he wears sandals, he also wears a purple shirt. Yesterday, André wore a bow tie. What else did he wear?

OR=logical or

Solve using truth table and reasoning

W=Tweed suit
S=Sandals
P=Purple Shirt
B=Bowtie
Deduction

\[ W \lor S \]
\[ (W \land P) \rightarrow \neg B \]
\[ W \rightarrow (P \lor S) \]
\[ S \rightarrow P \]
\[ B \]

\[ W=\text{tweed suit} \]
\[ S=\text{Sandals} \]
\[ P=\text{Purple Shirt} \]
\[ B=\text{Bowtie} \]
Set-Builder Notation

• \{-3,-2,-1,0,1,2,3\}
• The set of numbers that are divisible by 7 or 3.
• The set of odd integers
• The set of powers of two up to 100.
Set-Builder Notation

- $\{-3,-2,-1,0,1,2,3\}$
  - $\{x: x \in \mathbb{Z} \land |x| \leq 3\}$
- The set of numbers that are divisible by 7 or 3.
  - $\{x: \left(\frac{x}{7} \in \mathbb{Z}\right) \lor \left(\frac{x}{3} \in \mathbb{Z}\right)\}$
Set-Builder Notation

• The set of positive odd integers
  \( \{2x + 1: x \in \mathbb{N}\} \)

• The set of powers of two up to 100.
  \( \{2^x: (x \in \mathbb{N}) \land (2^x \leq 100)\} \)