

1. On the Island of Knights and Knaves, Bill says that Carl is a knave. Carl tells you, "Of me and Dan, only one is a knight", and Dan says, "Bozo and I are different". Can you tell who is a knight and who is a knave?
2. Show that the logic formulas $A \vee (B \wedge C)$ is the same as $(A \vee B) \wedge (A \vee C)$ using truth tables.
3. Let $A = \{\forall x \mid 1 \leq x \leq 4\}$, $B = \{\forall x \mid x \geq 2\}$, $C = \{\forall x \mid x \leq 3\}$. Write and draw the following sets on a number axis:
(a) \overline{A} ; (b) $A \cap B$; (c) $A \cap \overline{C}$; (d) $A \cap (\overline{B \cap C})$;
4. Of the 92 days of summer, we have had 15 rainy days and of these, 10 days were also windy. How many windy days did we have, if 60 days were nice (no rain nor wind)?
5. What are the odds to pull two red cards and then two spade cards out of a 52-deck card?
6. In a class of 12 students, what are the chances that someone will have a birthday in September?