

"Ideas..." problems for tutorials week 24

- I-24.1.** Rewrite the natural statement "You will receive a fine if you break a speed limit" in the form $P \Rightarrow Q$, explaining what P and Q are. Assuming that this 'theorem' is true, what is a necessary condition, and for what, in this implication? what is a sufficient condition, and for what?
- I-24.2.** Use truth table to show that the statements are logically equivalent:
 $P \Rightarrow (Q \Rightarrow R)$ and $(P \wedge Q) \Rightarrow R$.
- I-24.3.** Let $A = \{x \in \mathcal{U} \mid P(x) \text{ is true}\}$ and $B = \{x \in \mathcal{U} \mid Q(x) \text{ is true}\}$. Depict the sets \mathcal{U} , A , and B by using Venn diagrams. Determine the set $\{x \in \mathcal{U} \mid P(x) \Rightarrow Q(x) \text{ is true}\}$ on this diagram.