MATH 271: LaTeX Assignment 1

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1. Rewrite $R = \{3n : n \in \mathbb{Z} \wedge |2n| \geq 8\}$ in set roster notation by listing the elements.
2. Write the following in set builder notation. $\{ \cdots, -5, -1, 3, 7, 11, 15, 19, \cdots \}$
3. Let $Y = \{\{0, 1\}, \varnothing, 1\}$.
   (a) List the power set of Y, $\mathcal{P}(Y) =$
   (b) List $Y \times Y =$
4. Let the universal set $U = \{1, 2, 3, 4, 5, 6, 8, 7, 8, 9\}$, $A = \{2, 4, 6, 8\}$ and $B = \{3, 6, 9\}$.
   Find each of the following sets.
   (a) $A - B =$
   (b) $\overline{A} \cap B =$
   (c) $\overline{A \cup B} \cap A =$
5. Fill in the truth table.

P	Q	$\sim Q$	$(P \vee Q)$	$(P \wedge Q)$	$(P \implies Q)$	$(P \iff Q)$

6. Construct the truth table for $(P \vee R) \implies [(P \vee Q) \wedge (\sim Q \vee R)]$
7. Negate the following
   (a) $Q \vee \sim R$
   (b) $(\exists x \in \mathbb{Z})(x^2 < 2)$
   (c) $(\forall y \in \mathbb{R} - \{0\})(\exists x \in \mathbb{R})(xy = 1)$