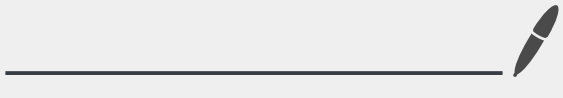
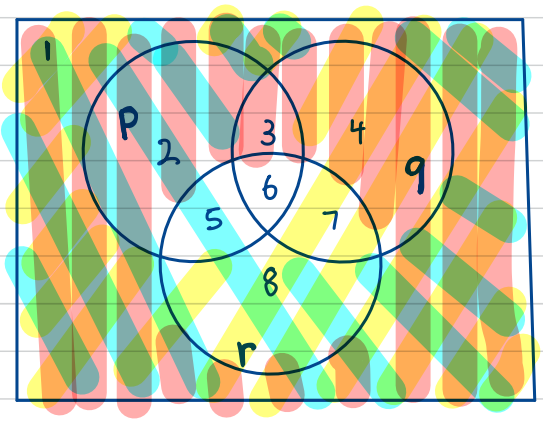


W8 Pre-Lecture

1. For the following Venn select all regions that make $p \wedge q \rightarrow \neg r$ true.



$\Leftrightarrow p \wedge q \rightarrow \neg r$

$\Leftrightarrow \neg(p \wedge q) \vee \neg r$ Conditional

$\Leftrightarrow \neg((p \wedge q) \wedge r)$ Reverse De Morgans

Ans: Everything other than 6.

2. Let's define $L(x,y)$ to be $x < y$ where x and y are natural numbers. For each of the following select the English meaning of the statement.

2a) $\exists x \in \mathbb{N}, \exists y \in \mathbb{N}, L(x,y)$

There is a natural number smaller than some natural number

2b) $\forall y \in \mathbb{N}, \exists x \in \mathbb{N}, L(x,y)$

Every natural number is bigger than some natural number

2c) $\forall x \in \mathbb{N}, \exists y \in \mathbb{N}, L(x,y)$

Every natural number is smaller than some natural number

2d) $\exists y \in \mathbb{N}, \forall x \in \mathbb{N}, L(x,y)$

There is some natural number that is bigger than all natural numbers