

**Review Q & A - Nov. 17**

**Written Test 2**

***Bridge Controller Lecture  
Practice Questions***

$$n < d \vee n = d \vdash n < d \vee n > 0$$

$d \in \mathbb{N}$
$n \in \mathbb{N}$
$n < d \vee n = d$
$\vdash$
$n < d \vee n > 0$

$\checkmark$  ①      ②

$n < d \vee n = d$

$\vdash$

$n < d \vee n > 0$

$\left\{ \begin{array}{l} \begin{array}{|l|} \hline n < d \text{ ①} \\ \hline \vdash \\ n < d \vee n > 0 \end{array} \quad (3) \quad \begin{array}{|l|} \hline n < d \\ \hline \vdash \\ n < d \end{array} \quad (4) \\[10pt] \begin{array}{|l|} \hline n = d \text{ ②} \\ \hline \vdash \\ n < d \vee n > 0 \end{array} \quad (5), (6) \quad \begin{array}{|l|} \hline \vdash \\ d < d \vee d > 0 \end{array} \quad (7) \quad \begin{array}{|l|} \hline \vdash \\ d > 0 \end{array} \end{array} \right.$

Each of Labels (1) to (7) denotes the justification for transforming the two neighboring sequents. Drag and drop the appropriate inference rule; otherwise, drag and drop "NONE" to indicate that no rule can be used for the transformation.

- (1): [MON]
- (2): [OR\_L]
- (3): [OR\_R1]
- (4): [HYP]
- (5): [EQ\_LR]
- (6): [MON]
- (7): [OR\_R2]

① → left of  $\vdash$

$$\begin{array}{l}
 d \in \mathbb{N} \\
 n \in \mathbb{N} \\
 n \leq d \\
 \vdash \\
 n-1 \in \mathbb{N}
 \end{array}$$

MON

$$\begin{array}{l}
 \boxed{n \in \mathbb{N}} \\
 \vdash \\
 n-1 \in \mathbb{N}
 \end{array}$$

~~P3~~  
ARI

$$\begin{array}{l}
 \boxed{n \geq 0} \\
 \vdash \\
 n-1 \in \mathbb{N}
 \end{array}$$

ARI

$$\begin{array}{l}
 n > 0 \vee n = 0 \\
 \vdash \\
 n-1 \in \mathbb{N}
 \end{array}$$

$$\frac{}{n \in \mathbb{N} \vdash 0 \leq n} \quad \text{P3}$$

You are required to attempt proving the above sequent, using the inference rules as listed here: <https://www.eecs.yorku.ca/~jackie/teaching/lectures/2022/W/EECS3342/notes/inference-rule-examples-1.pdf>

- 1st inference rule to use (if applicable): [MON]
- 2nd inference rule to use (if applicable): [?]
- 3rd inference rule to use (if applicable): [n.a.]
- 4th inference rule to use (if applicable): [n.a.]

Q13.  $n=10$  should not be chosen.