

523 Let t be an extended natural time variable. Is the following specification implementable?

- (a) $\forall n: \text{nat}. \mathcal{M}_n = n \wedge \mathcal{J}_n = t$
- (b) $\forall n: \text{nat}. \mathcal{M}_{w+n} = n-t \wedge \mathcal{J}_{w+n} = t-n$
- (c) $\forall n: \text{nat}. \mathcal{M}_{r+n} = n \wedge \mathcal{J}_{r+n} = t$
- (d) $\mathcal{M}_w = \mathcal{J}_w = t-1$

After trying the question, scroll down to the solution.

(a) $\forall n: \text{nat} \cdot \mathcal{M}_n = n \wedge \mathcal{J}_n = t$

§ No. If $w > 0$ and $n = 0$ we are writing a message that was already sent.

(b) $\forall n: \text{nat} \cdot \mathcal{M}_{w+n} = n-t \wedge \mathcal{J}_{w+n} = t-n$

§ No. When $n = 1$ we are specifying a time $t-1$ that is before now t .

(c) $\forall n: \text{nat} \cdot \mathcal{M}_{r+n} = n \wedge \mathcal{J}_{r+n} = t$

§ No. If $w > r$ and $n = 0$ then $r+n < w$, so we are writing a message that was already sent.

(d) $\mathcal{M}_w = \mathcal{J}_w = t-1$

§ No because the time of this message $t-1$ is before now t .