Exercise from fuzzy intersections.

Exercise 4.1 *Fuzzy sets A, B have the following vertical representations:*

$$\mu_A(x) = \begin{cases} \dfrac{x-1}{3}\,, & x \in [1,4]\,, \\ 1\,, & x \in [4,6]\,, \\ 7-x\,, & x \in [6,7]\,, \\ 0\,, & \textit{otherwise}\,, \end{cases}$$

$$\mu_B(x) = \begin{cases} \dfrac{x-2}{3}\,, & x \in [2,5]\,, \\ 1\,, & x \in [5,6]\,, \\ \dfrac{8-x}{2}\,, & x \in [6,8]\,, \\ 0\,, & \textit{otherwise}\,. \end{cases}$$

Find their standard, product, and Łukasiewicz intersections.

Exercise from fuzzy algebras.

Exercise 4.2 *Decide whether the equality*

$$\alpha \mathbin{\dot\vee} (\alpha \mathbin{\dot\wedge} \beta) = \alpha$$

holds for all α, β for the following choices of operations $\dot\wedge, \dot\vee$:

1. $\underset{\mathrm{S}}{\wedge}, \overset{\mathrm{S}}{\vee}$,
2. $\underset{\mathrm{P}}{\wedge}, \overset{\mathrm{S}}{\vee}$,
3. $\underset{\mathrm{P}}{\wedge}, \overset{\mathrm{L}}{\vee}$,
4. $\underset{\mathrm{L}}{\wedge}, \overset{\mathrm{P}}{\vee}$,
5. $\underset{\mathrm{P}}{\wedge}, \overset{\mathrm{S}}{\vee}$,
6. $\underset{\mathrm{L}}{\wedge}, \overset{\mathrm{L}}{\vee}$.