

Solution to Problem 18

Task. If we only use numbers with 2 digit after the decimal point, and we use rounding that preserves guaranteed bounds, what will be the result of multiplying the intervals $[0.20, 0.69]$ and $[0.39, 0.61]$?

Solution. The exact product of the two intervals is

$$[0.20 \cdot 0.39, 0.69 \cdot 0.61] = [0.0780, 0.4209].$$

To get guaranteed bounds, we need to round down the lower endpoint, to 0.07, and round up the upper bound, to 0.43. Thus, the resulting interval is $[0.07, 0.43]$.