Checking a Rinse When Flow Is Uneven

Scoring guide · one credit per question · review written work against each rubric

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Question 1

Choice (1)

P has 8 mg/L during its 6 L interval. Q has 8 mg/L during its 2 L interval.

Question 2

P contains 2 × 4 + 6 × 8 = 56 mg. Q contains 6 × 4 + 2 × 8 = 40 mg. Both exceed 30 mg.

Question 3

Both unweighted means are 6 mg/L. P sends 6 L through at 8 mg/L, while Q sends only 2 L at that concentration. Weighting by volume gives 56 mg for P and 40 mg for Q. The simple mean ignores the different volumes.

Question 4

The maximum is 30 mg divided by 8 L, or 3.75 mg/L. A higher concentration in the full 8 L would exceed 30 mg.

Question 5

The mixture contains 8 × 5.5 = 44 mg. If all 8 L had been at 4 mg/L it would contain 32 mg. Each liter at 8 mg/L contributes 4 mg more than that baseline. The excess 12 mg requires 3 L from the high interval, leaving 5 L from the low interval.