Checking a Sensor That Tops Out

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A classroom meter measures a rinsewater signal in model units. A reference has a known true signal. The class tests two meters over the same range. Meter B's error is assumed to be constant within this range if the reference results support that model.

True reference signal	Meter A display	Meter B display
4	4	4.5
8	8	8.5
10	8	10.5
12	8	12.5

1 Which pair of references most directly shows that A can give the same display for different true signals?

(1) 4 and 8

(2) 4 and 10

(3) 8 and 12

(4) The two meters always give identical readings.

2 Explain why subtracting one constant from A's display cannot recover both true signals of 8 and 12. [1]

Answer and work

The unknown rinsewater gives 8 on A and 11.5 on B. The sample is within the range of the reference tests.

3 Estimate the true signal from B. State what correction is supported by its reference readings. [1]

Answer and work

4 Describe a check that tests whether A stays limited to a display of 8 for true signals between 8 and 10. [1]

Answer and work