Choosing a Gauge for a Model Channel

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

A model channel carries a rinse solution past a sensor. The channel works only if its width is at most 1.00 mm. A gauge’s maximum error means the actual width can be that much above or below its reading. The class approves a channel only when every width in the resulting range meets the limit.

Gauge	Displayed width (mm)	Maximum error (mm)
P	0.96	0.06
Q	0.98	0.01
R	1.01	0.02

1 Which gauge reading is enough to approve the channel under the rule?

(1) P only

(2) Q only

(3) P and Q only

(4) R only

2 Find the range of possible widths for the P reading. Use the stated maximum error. [1]

Answer and work

3 A student says R proves the channel is too wide. Evaluate the claim using the R range. [1]

Answer and work

The class confirms that Q and R measured the same unchanged channel and that both stated error bounds apply.

4 Find a width that fits both the Q and R readings, or explain why there is none. Use both ranges to decide whether the channel can be approved under the stated rule. [1]

Answer and work