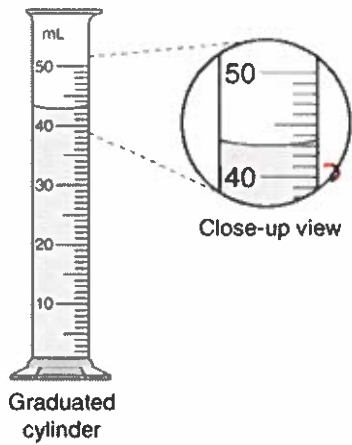
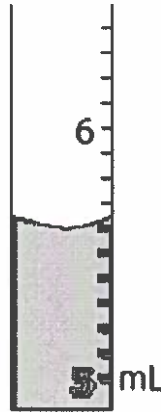


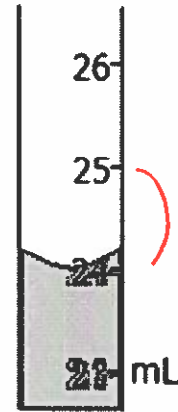
1. Determine the measurements shown on each of the graduated cylinders shown below. Indicate the absolute uncertainty and units with each measurement.



a) $(43.0 \pm 0.5) \text{ mL}$



b) $(5.59 \pm 0.05) \text{ mL}$

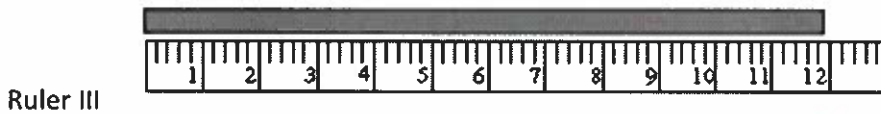
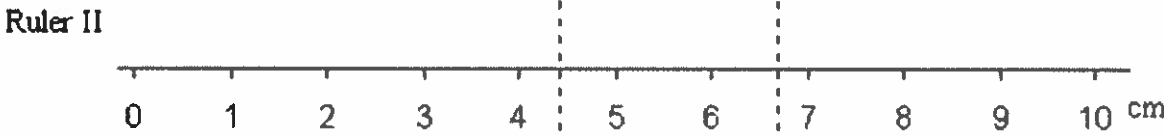
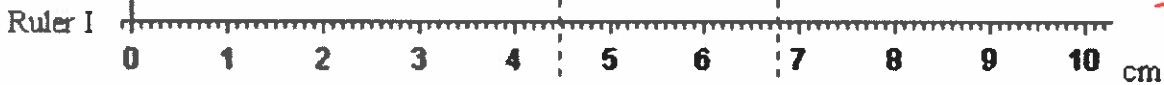


c) $(24.0 \pm 0.5) \text{ mL}$

2. Determine the length of each steel rod shown below. Indicate the absolute uncertainty and units with each measurement. (Rulers "a" and "c" are 12 cm long.)

Object A

Object B



a) $(6.79 \pm 0.05) \text{ cm}$
Object A with ruler I

b) $(4.4 \pm 0.5) \text{ cm}$
Object B with ruler II

c) $(11.9 \pm 0.1) \text{ cm}$
Object C with ruler III

3. An irregular object is placed into a graduated cylinder that contains $(54.3 \pm 0.5) \text{ mL}$ of water. The water level appears to rise to $(93.6 \pm 0.5) \text{ mL}$. How much water does the object displace? Include units and uncertainties in you final answer. Show your work.

$$\begin{aligned}
 (A - B) \pm (\delta A + \delta B) &= (93.6 - 54.3) \pm (0.5 + 0.5) \\
 &= 39.3 \pm 1.0 \\
 &= 39 \pm 1
 \end{aligned}$$

Final Answer: $(39 \pm 1) \text{ mL}$