

A)

$$\begin{aligned} 1) \quad A &= lw \\ &= (5.00 \pm 0.05)(2.00 \pm 0.04) \\ &= 10.0 \pm \Delta z \end{aligned}$$

$$\begin{aligned} \Delta z &= z \sqrt{\left(\frac{\Delta x}{x}\right)^2 + \left(\frac{\Delta y}{y}\right)^2} \\ &= 10.0 \sqrt{\left(\frac{0.05}{5}\right)^2 + \left(\frac{0.04}{2.00}\right)^2} \\ &= 10.0 \sqrt{1 \times 10^{-4} + 4 \times 10^{-4}} \\ &= 0.2236 \end{aligned}$$

$$\Delta z = 0.224$$

$$A = 10.0 \pm 0.224 \text{ m}^2$$

B)

To minimize uncertainty, the experiment and data should be repeatable, the equipment used should be precise, and every iteration of the experiment should be performed with the same equipment and materials.

To measure the volume displacement with the beaker, mark the 500 ml fill line with a piece of tape. Fill the beaker with 500 ml of water. Ensure that the beaker and graduated cylinder can measure 0.01 ml to ensure precision. Next, pour the water into the graduated cylinder, checking that the cylinder measures the same amount of water. Place the subject into the beaker and mark the final water level using tape. Repeat this experiment 3-5 times with the same beaker, cylinder, object, and water.