

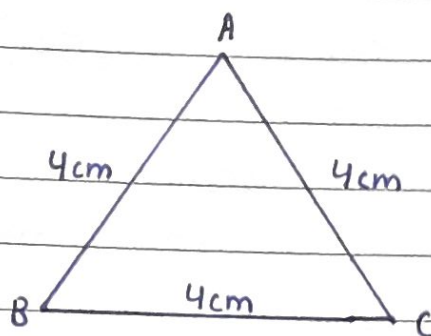


EXPERIMENT : 3

* Aim → To find the outer radius of a watch glass by using spherometer.

* Apparatus required → Spherometer, watch glass

* Formula used →
$$r = \frac{l^2}{6h} + \frac{h}{2}$$



$$\begin{aligned} l &= (AB + BC + CA) / 3 \\ &= (4 + 4 + 4) \text{ cm} \\ &= 12 \\ &= 4 \text{ cm} \end{aligned}$$

$$\begin{aligned} * \text{ Error} &= 100 - 93 \\ &= +7 \end{aligned}$$

$$\begin{aligned} * \text{ Least Count} &= 0.01 \text{ mm} \\ &= 0.001 \text{ cm} \end{aligned}$$

* Table for h →

S.N.	M.S.R (x) mm	C.S.R (n)	$h = x + n(L.C)$	Mean
1.	2.0	40	$2.0 + 0.40 = 2.40 \text{ mm}$	⇒ 12.89 5
2.	2.0	39	$2.0 + 0.39 = 2.39 \text{ mm}$	
3.	2.0	71	$2.0 + 0.71 = 2.71 \text{ mm}$	⇒ 2.578 mm
4.	2.0	69	$2.0 + 0.69 = 2.69 \text{ mm}$	
5.	2.0	70	$2.0 + 0.70 = 2.70 \text{ mm}$	

Teacher's Signature



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Calculation of Mean $\Rightarrow h = \frac{2.40 + 2.39 + 2.71 + 2.69 + 2.70}{5}$
 $= \frac{12.89}{5} = 2.578 \text{ mm}$

$$R = \frac{l^2}{6(n)} + \frac{h}{2}$$
$$= \frac{4^2}{6(2.578)} + \frac{2.578}{2}$$
$$= 1.034 + 1.289$$
$$= 2.323 \text{ mm}$$

Result: The radius of curvature of the given watch glass is 2.323 mm.

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Precautions:

- * There should be no friction in the screw.
- * Move the screw in only one direction to avoid the backlash error.
- * Take at least five reading.
- * Additional circular division should be calculated carefully.
- * With the help of the screw, press the spherometer on the practical notebook to get the pricks of the legs. Mark them A, B and C.
- * Note the distance between AB, BC and CA.