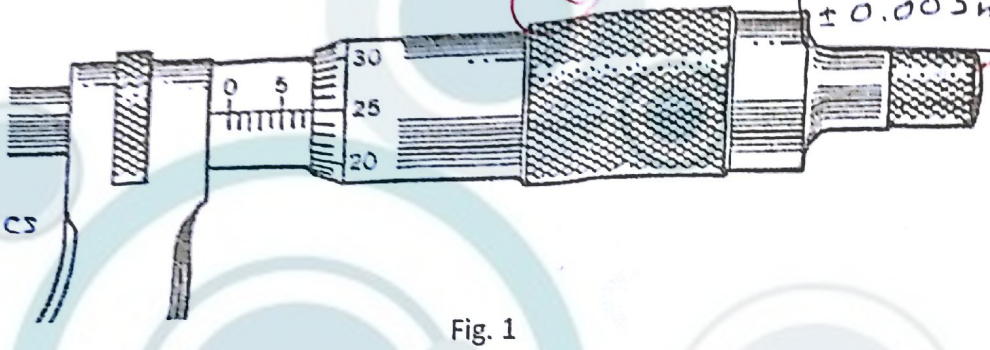
1. A) The micrometer in Fig. 1 reads 2.25 mm, with an uncertainty of 0.01 mm → أقل قيمة ± 0.005 mm



lab physics

Fig. 1

B) If this micrometer was used to measure the thickness of the sheet in Fig. 2 at different points along the sheet, as shown in the same figure. and the results were as shown in Table 1. Then the mean value of the sheet's thickness is 1.29 with ar uncertainty of ... 9×10^{-3} mm

Fig. 2

point	Diameter (mm)
a	1.30
b	1.29
c	1.29
d	1.28

Table. 1

$\sigma = \sqrt{\frac{(x-\bar{x})^2}{N-1}}$ 3×9

$(0.01)^2 + (0.01)^2$ 2×10^{-9}

C) If the height and width of this sheet were measured using the same micrometer and the results were 5.34 mm and 5.15 mm, respectively. Then the volume of the sheet is 35.98, with an uncertainty of ≈ 0.12 ...

$V = h * w * \text{thickness}$

نسبة الخطأ $\Delta V = V * \sqrt{\left(\frac{\Delta h}{h}\right)^2 + \left(\frac{\Delta w}{w}\right)^2 + \left(\frac{\Delta t}{t}\right)^2}$ → thickness

2. Fig. 3 shows a portion of a tape which was taken in Lab 111 for the kinematics experiment where the used vibrator makes 200 vibrations per second.

a) If the displacement between A and B is 3.1 cm, then the average speed in this interval is $\frac{\Delta x}{\Delta t} = 31$ cm/s

b) Given the displacement between A and B above, if the displacement between B and C is 2.5 cm, then the average acceleration between A and C is $\bar{a} = \frac{\Delta \vec{v}}{\Delta t} = \frac{28}{0.2} = 140$ cm/s²

c) The maximum speed is between the points C and D, and the minimum speed is between the points D and E

$v = \frac{\Delta x}{\Delta t} = 28$

d) The maximum acceleration is between the points B and D

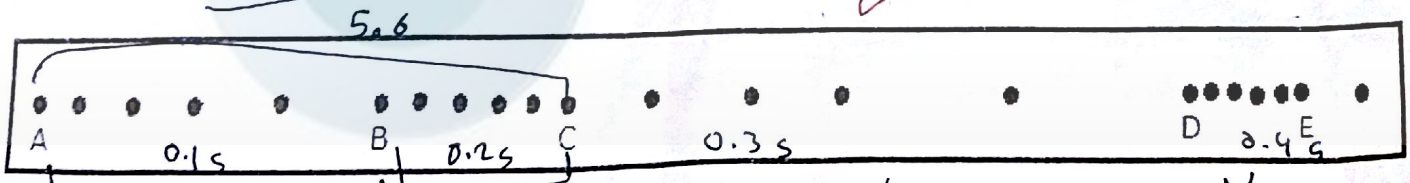


Fig. 3

$v_3 > v_4$

31 3.1 2.5 25 90 20

$t = 0.1$ s

1. A) The micrometer in Fig. 1 reads ... with an uncertainty of ...

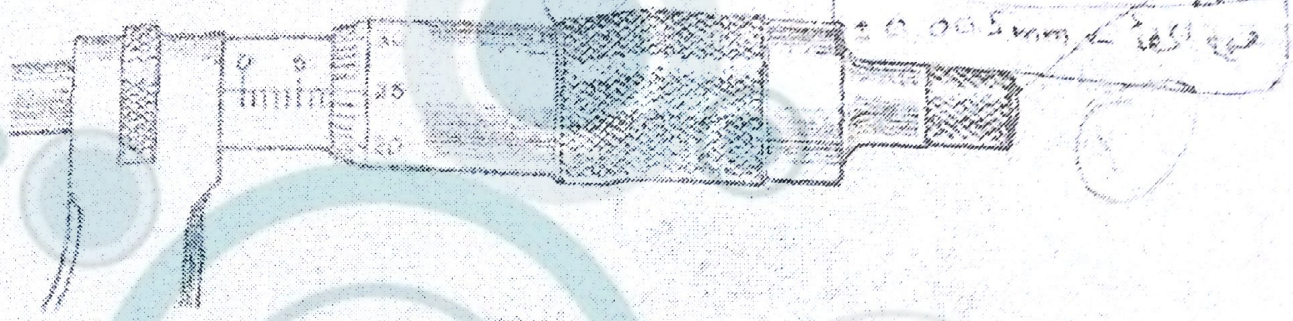


Fig. 1

B) If this micrometer was used to measure the thickness of the sheet in Fig. 2 at different points along the sheet, as shown in the same figure, and the results were as shown in Table 1. Then, the mean value of the sheet's thickness is 1.29 with an uncertainty of ...

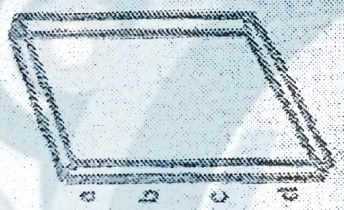


Fig. 2

point	Diameter (mm)
a	1.30
b	1.29
c	1.29
d	1.28

Table. 1

C) If the height and width of this sheet were measured using the same micrometer and the results were 5.34 mm and 5.15 mm, respectively. Then the volume of the sheet is ... with an uncertainty of ± 0.12 ...

2. Fig. 3 shows a portion of a tape which was pulled through a ticker-timer by a constant speed where the used vibrator makes 240 dots per second.

a) If the displacement between A and B is 3 cm, then the average speed in this interval is $\frac{\Delta x}{\Delta t} = 31\ cm/s$

b) Given the displacement between A and B is 3 cm, the displacement between B and C is 2.5 cm, then the average acceleration between A and C is ... $180\ cm/s^2$

c) The maximum speed is between the points ... and ... and the minimum speed is between the points ... and ...

d) The maximum acceleration is between ... and ...