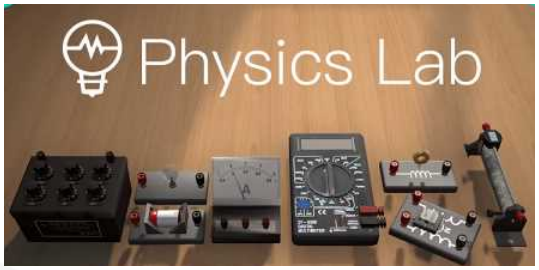
final exam of PW-Phy



final exam of PW-Physic

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Practical work of physic for 1 st year license common Base

Credit=2,Coefficient =1, Hourly volume,24 h in each semesters

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1.0

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Objectives

The successful student would thus be ready to move on to the next level.

I final exam

1. Part 1.Estimation Of The Inaccuracy In Physical Measurements (10point)

We want to determine the surface of a rectangle (figure 1). We measure its length l and its width d. The surface is given by the function s = l *d..

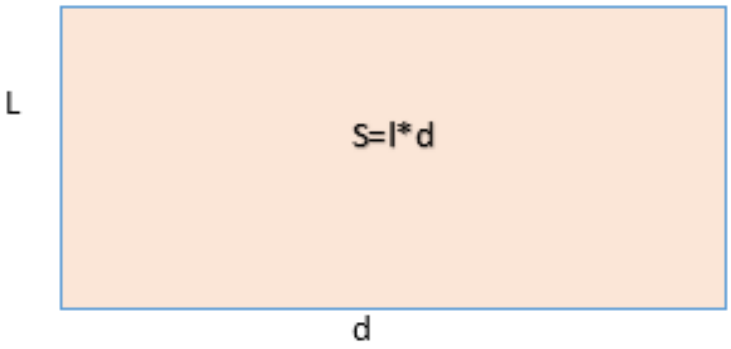

Figure 1. The surface of a rectangle of length l and width d.

The values noted are as follows:

n° mesure	1	2	3	4	5
d	4. 1	4.3	4. 2	4. 5	4. 6
l	6	5.9	6.2	6.1	5.8
s					

1.1. Questions :

1- Calculate the mean measured value. $\bar{s}$ =

2- Calculate the error mean absolute $\Delta\bar{s}$ =

3-Calculate the absolute uncertainty and relative Δl=..... Δl/$\bar{l}$ =.....

4- Calculate the absolute uncertainty and relative Δd=..... Δd/$\bar{d}$ .....

5- gives the expressions of absolute uncertainty $\Delta\bar{s}$ as a function of d, l, Δd and Δl.

6 - Write the measured value in the fom : s= $\bar{s}$ ±Δs; s=

2. Part 2:Elastic collision (10point)

• Assemble the setup as shown in Figure 2.

• Adjust the distance between the optical barriers so that the collision occurs between them.

• Before the collision, one of the carts, with a fixed mass of m1 = 765 grams, is in motion while the other cart, with additional "ms" masses, has a variable mass of m2 = mcart + ms = 265 + ms grams and is at rest.

• When they pass through, the chronometer records the corresponding time "δt1."

• After the collision, both carts in motion move in opposite directions, each passing through an optical barrier. The chronometer records two more passage times, "δt'1" and "δt'2."

M_2 (grs)	265	765	1265
δt_1 (s)	0.003	0.003	0.003
$\delta t_{'1}$ (s)	0.005	0.00	0.031
$\delta t_{'2}$ (s)	0.030	0.008	0.007
$v=\delta x/\ \delta t_1$ (m/s)			
$v'_1=\delta x/\ \delta t'_1$ (m/s)			
$v'_2=\delta x/\ \delta t'_2$ (m/s)			
$E_{c1}=m_1.v^2_1/2$ (J)			
$E'_{c1}=m_1.v'^2_1/2$ (J)			
$E'_{c2}=m_2.v'^2_2/2$ (J)			
$P_1=m_1.v_1$			
$P'_1=m_1.v'_1$			
$P'_2=m_2.v'_2$			
$(P_1+P_2)/(P'_1+P'_2)$			
$(E_{c1}+E_{c2})/(E'_{c1}+E'_{c2})$			

2.1. QUESTION

1- Complete the table.

2- Based on the table's results, what concluding

II standard correction

1. part 1(10point)

rectangle ,length l and its width w. The surface is given by the function s = l * w."

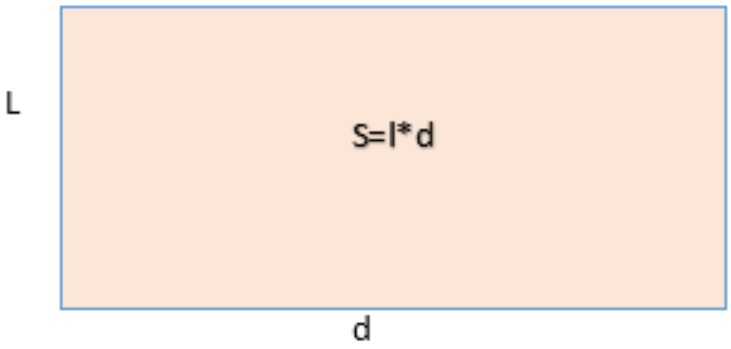

Figure 1. The surface of a rectangle of length l and width d.

determine the surface of a rectangle 1 point

n° mesure	1	2	3	4	5
d	4. 1	4.3	4. 2	4. 5	4. 6
l	6	5.9	6.2	6.1	5.8
s	24.5	25.37	26.04	27.45	26.68

1- the mean measured value. $\bar{s}$ *=26.008..... (1point)*

2- the error mean absolute $\Delta\bar{s}$ *=0.86 .....(1point)*

3- the absolute uncertainty and relative $\bar{l}$ *= 6.....Δl=0.1.....(2point)*

4-the absolute uncertainty and relative $\bar{d}$ *= 4.35.....Δd=0.16.....(2point)*

5- gives the expressions of absolute uncertainty $\Delta\bar{s}$ as a function of *d*, *l*, *Δd* and *Δl.....(2.75point)*

6-: s= $\bar{s}$±Δs; s=*.....(0.25)*

2. part 2(10point)

Elastic collsion

M_2 (grs)	265	765	1265
δt_1 (s)	0.003	0.003	0.003
$\delta t_{'1}$ (s)	0.005	0.00	0.031
$\delta t_{'2}$ (s)	0.030	0.008	0.007
$v=\delta x/\delta t_1$ (m/s)	1.66	1.66	1.66
$v'_1=\delta x/\delta t'_1$ (m/s)	0.652	0.51	0.714
$v'_2=\delta x/\delta t'_2$ (m/s)	1.66	1.25	0.164
$E_{c1}=m_1.v^2_1/2$ (J)	0.151	0.625	0.275
$E'_{c1}=m_1.v'^2_1/2$ (J)	1.25	0.002	0.002
$E'_{c2}=m_2.v'^2_2/2$ (J)	0.27	0.95	0.76
$P_1=m_1.v_1$	0.002	0.5	0.332
$P'_1=m_1.v'_1$	0.156	0.031	0.032
$P'_2=m_2.v'_2$	0.49	0.312	0.214
$(P_1+P_2)/(P'_1+P'_2)$	1.5	1.54	1.33
$(E_{c1}+E_{c2})/(E'_{c1}+E'_{c2})$	1.6	1.2	1.3

calculated the momentum and kinetic energy by measuring the velocities of the object before and after the collision

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The momentum and kinetic energy are conserved for elastic collisions