

Gr:	<i>First Name :</i>	
	<i>Last Name :</i>	
	<i>N°</i>	

TP-4 Inclined Plane

Experiment 1

Motion, without friction, of a cart on an Inclined Plane

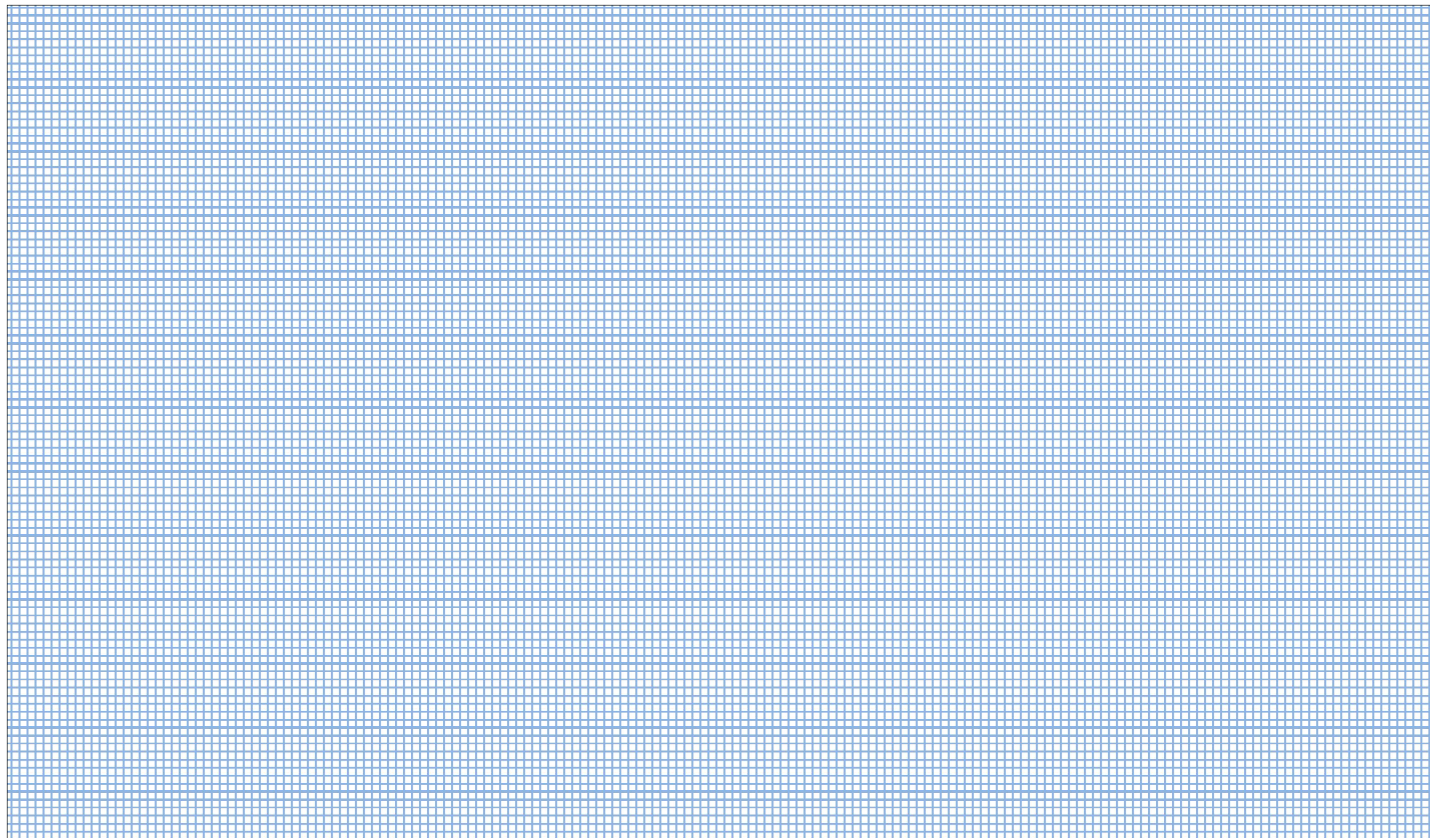
- The angle of inclination α of the plane is: $\alpha = 5^\circ$.
- Fill in Table 1.

<i>X(m)</i>	0,2			0,3			0,4			0,5			0,6			0,7		
<i>t (s)</i>																		
<i>t²(s²)</i>																		

Table 1

Kinematic Study

1. Plot the graph of $x = f(t^2)$ on millimeter paper.



2. The motion of the cart is uniformly accelerated: *true* *false*

The position x of the mobile as a function of time t (we will take as initial conditions: at $t=0$ $x=0$ et $v=0$) is written:

The shape of the curve $x = f(t^2)$ is:.....

3. The acceleration a of the cart is:

Dynamics Study

4. The forces acting on the cart are:

.....
.....
.....
.....
.....
.....
.....

5. The fundamental law of dynamics is:

.....
.....

% ox :

% oy :

6. The relation between a , g , and $\sin(\alpha)$ is in the form:

.....
.....

7. Verification of the relation using our experimental data (we will take $g = 9,8 \text{ ms}^{-2}$):

.....
.....
.....

Experiment 2

Motion, with friction, of a mass M on an inclined plane

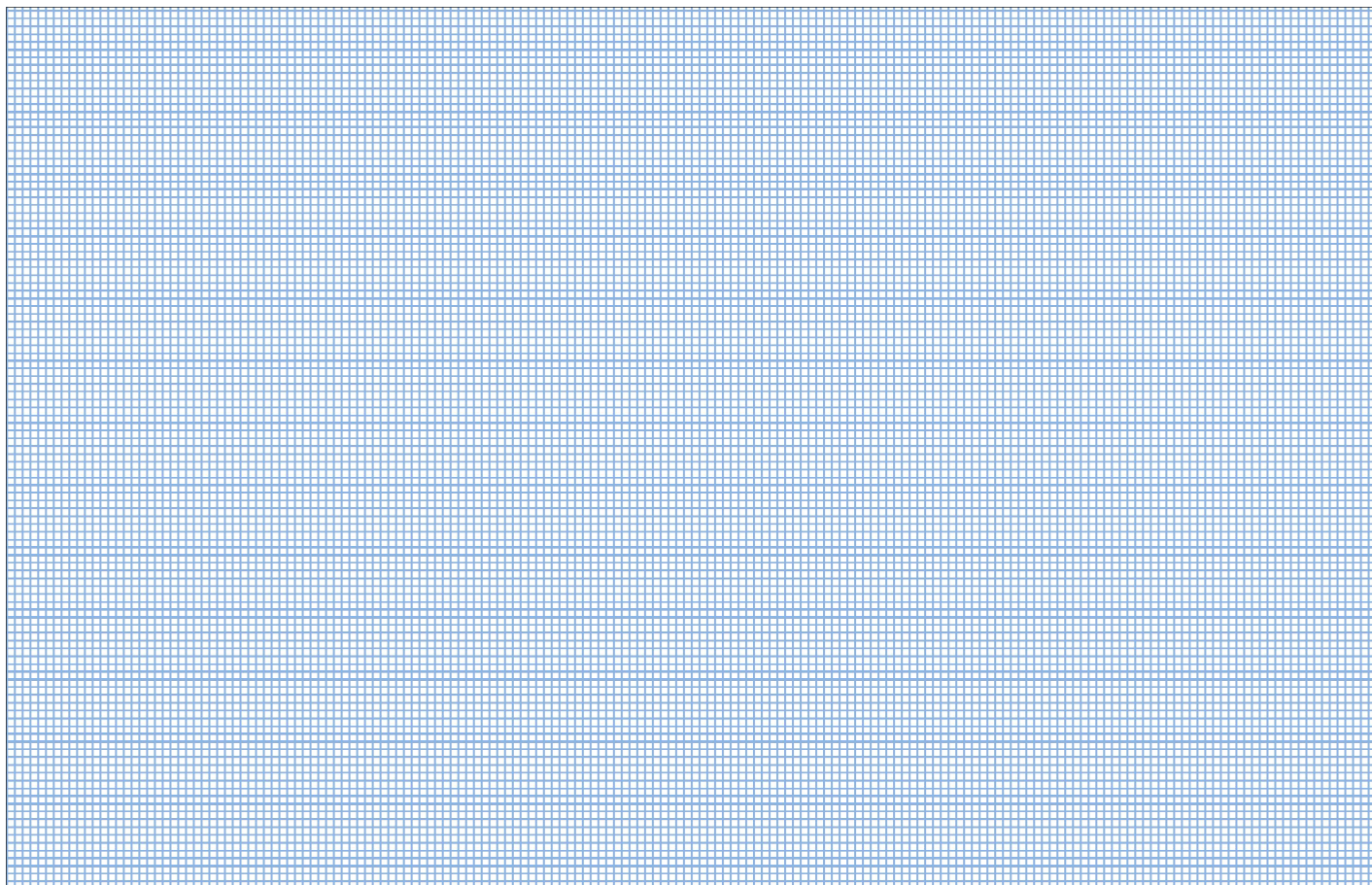
- The angle of inclination α of the plane is: $\alpha = 20^\circ$.
- Fill in Table 2.

$X(m)$	0,2			0,3			0,4			0,5			0,6			0,7		
$t (s)$																		
$t^2(s^2)$																		

Table 2

Kinematic Study

1. Plot the graph of $x = f(t^2)$ on millimeter paper.



2. The acceleration a of mass M is:

Dynamics Study

3. The forces acting on the mass M are:

.....

.....

.....

.....

.....

.....

.....

.....

4. The fundamental law of dynamics is:

.....
.....

% *ox*:

% *oy*:

5. Determination of the expression of the frictional force F_f as a function of M , a , g , and $\sin\alpha$:

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

6. Determination of the dynamic friction coefficient μ_d (its expression and numerical value).

Given that:

$$F_f = \mu_d(Mg)\cos\alpha \text{ et } g = 9.8 \text{ ms}^{-2}$$

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

7. Conclusion

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....