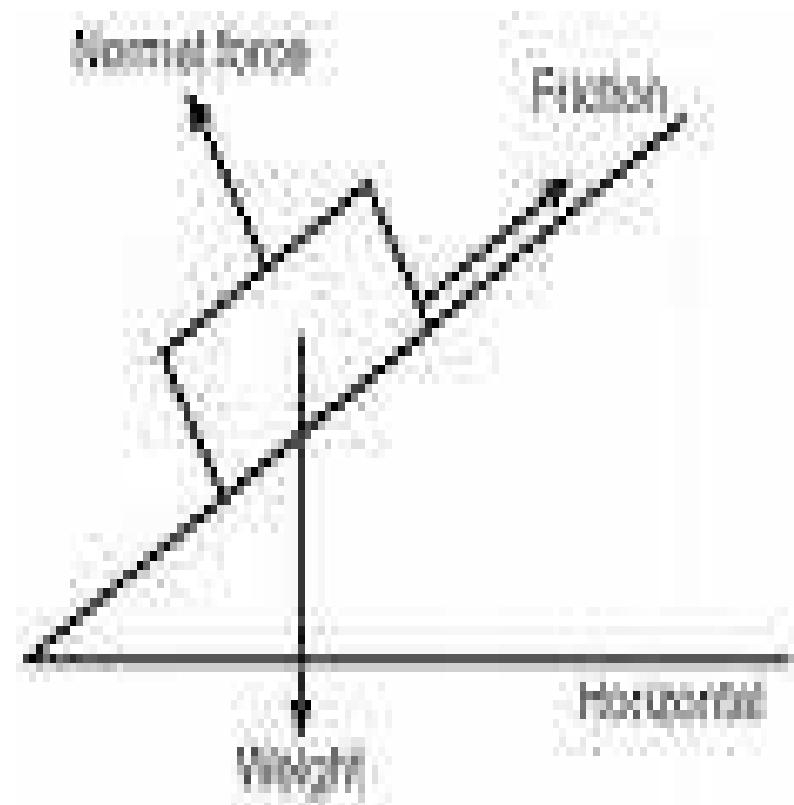
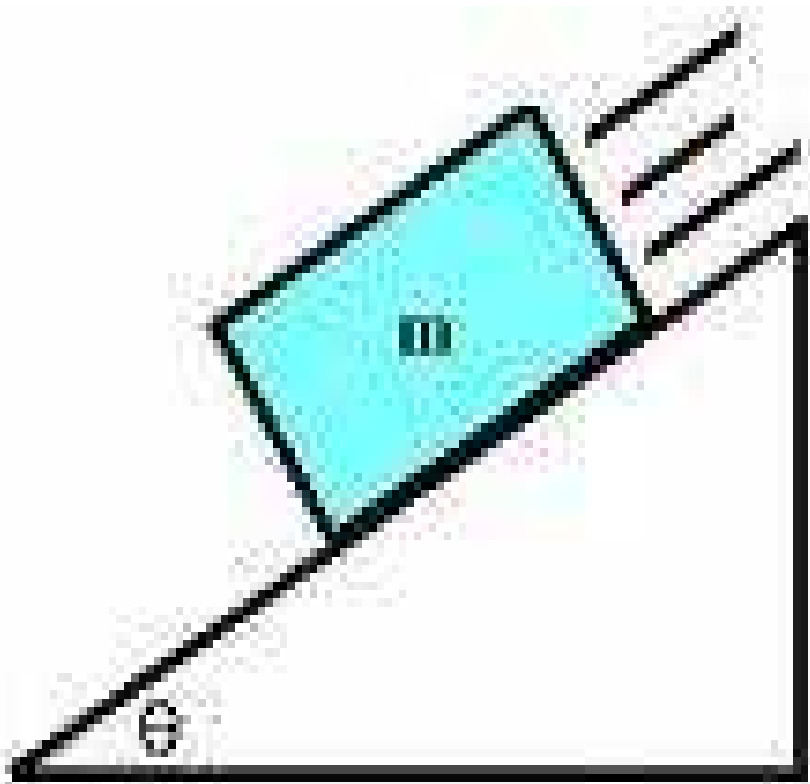


Introduction to Mechanics

What is Mechanics???

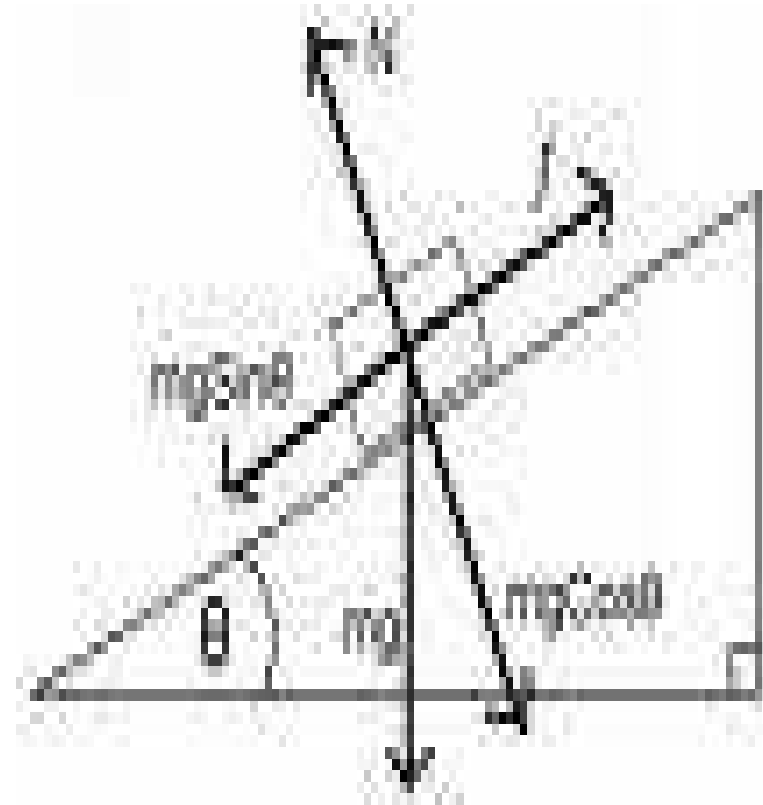
- Mechanics is the branch of physics concerned with the behavior of physical bodies when subjected to forces or displacements, and the subsequent effect of the bodies on their environment.
 - Applied mechanics is a branch of the physical sciences and the practical application of mechanics
 - Applied mechanics can be subdivided into statics, dynamics, fluid mechanics, deformation mechanics among others
 - Dynamics deals with the effects of forces on the motion of objects
-

Motion along an inclined plane



Equations of dynamic motion

- Normal Reaction $N = mg\cos\theta$
- Frictional force $f = \mu N = \mu mg\cos\theta$
- Resultant force F along the inclined plane is $F = mg\sin\theta - \mu mg\cos\theta$
- Resultant acceleration is given by $a = g\sin\theta - \mu g\cos\theta$



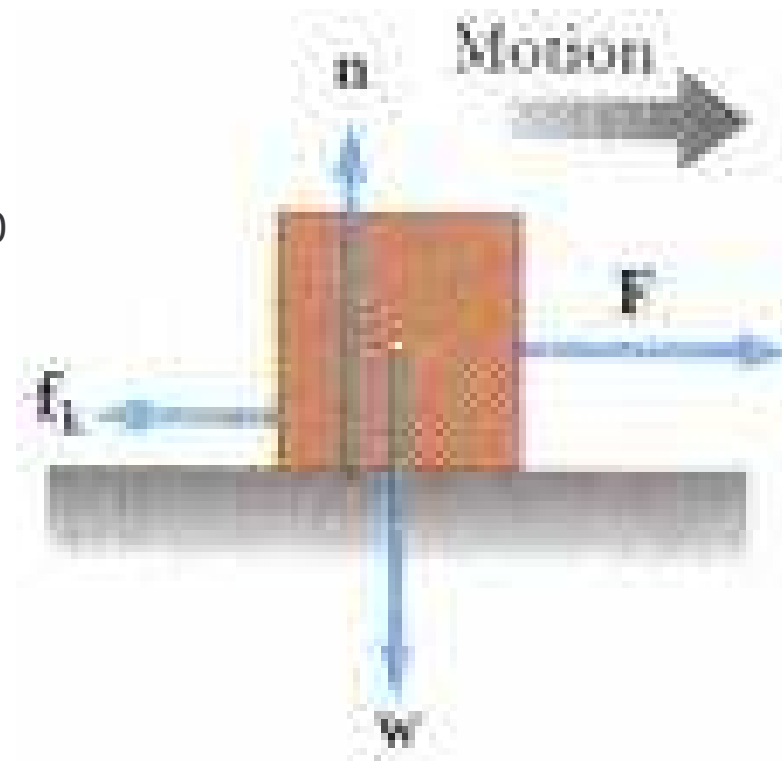
Equations of kinematics

On the Inclined plane

- $a = g\sin\theta - \mu g\cos\theta$
- Final velocity $v = u + at$ (Assuming $u = 0$)
- Displacement $S = ut + (at^2)/2$ where $u = 0$

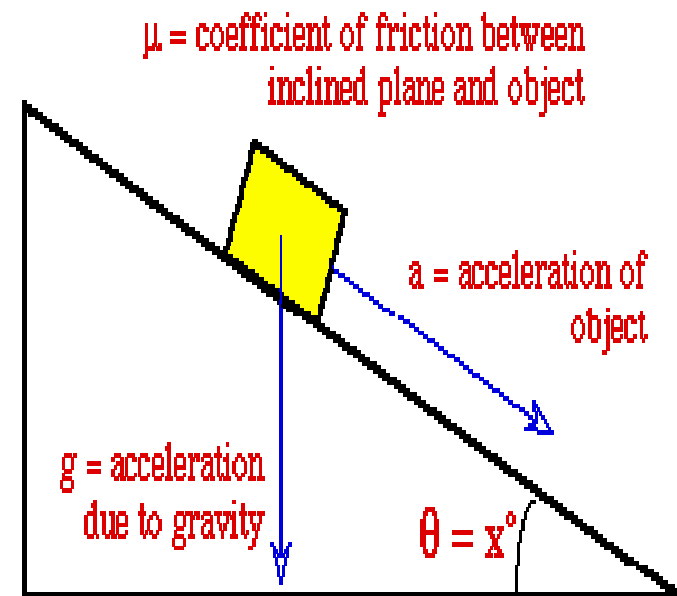
On the ground

- $F = 0, f = \mu N = \mu mg$
- Resultant force = $F - f = -\mu mg$
- Resultant acceleration $a = -\mu g$
- Final velocity $v = u + at$
where $v = 0$ and $a = -\mu g$
- Displacement $S = ut + (at^2)/2$
where $a = -\mu g$



Measuring the acceleration

- A single-axis accelerometer
- Determination of direction of sensing plane
- Collecting the data
- Determination of other parameters



Acceleration of an object on an inclined plane

References

- Wikipedia, the free online encyclopedia
 - <http://www.physicsclassroom.com>
-

Dynamics – May the ‘Force’ be with you!!!

