

CIE A-Level Physics

4 - Dynamics

Flashcards

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If an object is in equilibrium it means the
object is...



If an object is in equilibrium it means the object is ...

Not accelerating; it is either:

- Stationary.
- Moving at a constant velocity.



Which of Newton's Laws states that 'every action force has an equal and opposite reaction force'?



Which of Newton's Laws states that 'every action force has an equal and opposite reaction force'?

Newton's third law.



What is Newton's second law?



What is Newton's second law?

$$F = ma$$

Where F is force (N), m is mass (kg) and
 a is acceleration (ms^{-2})



What is Newton's first law?



What is Newton's first law?

An object at rest or moving with constant velocity will stay that way unless a resultant force acts upon it.



What is weight?



What is weight?

Weight (N) is the product of mass (kg) and the acceleration due to gravity, g (ms^{-2})

$$W = mg$$



What is meant by terminal velocity?



What is meant by terminal velocity?

When the air resistance and thrust force becomes balanced the resultant force is 0. The acceleration becomes zero and the object moves at a constant maximum velocity.



What is the difference between elastic and inelastic collisions?



What is the difference between elastic and inelastic collisions?

In an elastic collision, the kinetic energy before is equal to the kinetic energy afterwards – no energy is lost. However, in an inelastic collision, the kinetic energy at the end is not equal to the kinetic energy at the start – some energy is lost to the surroundings.



Give an equation that can be used to calculate momentum.



Give an equation that can be used to calculate momentum.

$$\textit{momentum} = \textit{mass} \times \textit{velocity}$$

The units of momentum are kgms^{-1}



True or false? Linear momentum is only conserved in elastic collisions.



True or false? Linear momentum is only conserved in elastic collisions.

False, linear momentum is always conserved.



The rate of change of momentum can also be described as...



The rate of change of momentum can also be described as...

...the resultant force.



What is impulse?



What is impulse?

The change in momentum.

$$F\Delta t = \Delta(mv)$$



What does the area underneath a force-time graph represent?



What does the area underneath a force-time graph represent?

Impulse, the change in momentum.



What is the equation used for the principle of conservation of momentum in one-dimensional collisions?



What is the equation used for the principle of conservation of momentum in one-dimensional collisions?

$$m_1 u_1 + m_2 u_2 = m_1 v_1 + m_2 v_2$$



A force of 18N acts on an object of 6kg,
what is the object's acceleration?



A force of 18N acts on an object of 6kg, what is the object's acceleration?

$$F = ma, \text{ rearrange to } a = F / m$$

$$a = 18/6$$

$$a = 3\text{ms}^{-2}$$



True or false? For an elastic collision the relative speed of approach is faster than the relative speed of separation.



True or false? For an elastic collision the relative speed of approach is faster than the relative speed of separation.

False, they are equal.

