Edexcel Physics A-Level

Topic 2.2 - Newton's Laws and Momentum

Flashcards

State Newton's first law of motion in words.

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An object at rest will remain at rest, and an object moving with a given velocity will continue moving with that same velocity, unless acted on by an external resultant force.

State Newton's second law of motion in words.

State Newton's second law of motion in words.

The acceleration of an object is directly proportional to the resultant force acting on it and inversely proportional to its mass.

State the defining equation of Newton's second law of motion.

State the defining equation of Newton's second law of motion.

$$\Sigma F = ma$$

Resultant Force (N) = Mass (kg) x Acceleration (ms^{-2})

Can an object travelling with constant speed change direction, without an external force acting?

Can an object travelling with constant speed change direction, without an external force acting?

For an object to change direction, its velocity must change. This means there must be an acceleration. An acceleration cannot occur without an external resultant force acting.

Describe the forces acting on an object travelling at terminal velocity.

Describe the forces acting on an object travelling at terminal velocity.

- The forces are balanced in both the vertical and horizontal components of its motion
- There is no resultant force, and therefore no acceleration

What is meant by terminal velocity?

What is meant by terminal velocity?

For a given set of conditions, the terminal velocity is the maximum speed of the object. An object has zero acceleration at terminal velocity.

State the equation used to calculate the weight of an object.

State the equation used to calculate the weight of an object.

$$W = mg$$

Weight = Mass x Gravitational Field Strength

What is the unit of weight?

What is the unit of weight?

Newton, N

State Newton's third law of motion in words.

State Newton's third law of motion in words.

Every action has an equal and opposite reaction. This means that there is always a pair of forces acting on interacting objects, equal in magnitude, but in opposite directions.

State the equation for momentum.

State the equation for momentum.

$$p = mv$$

Momentum = Mass x Velocity

What is the unit of momentum?

What is the unit of momentum?

$kgms^{-1}$

What is the consequence of the linear conservation of momentum?

What is the consequence of the linear conservation of momentum?

The total momentum of a system before an event is always equal to the total momentum of the system after the event.