

F = Ma

Question Paper

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|------------|-----------------|
| Level | A Level |
| Subject | Physics |
| Exam Board | Edexcel |
| Topic | Mechanics |
| Sub Topic | F = ma |
| Booklet | Question Paper |
| Paper Type | Multiple Choice |

Time Allowed: 10 minutes

Score: /9

Percentage: /100

Grade Boundaries:

| A* | A | B | C | D | E | U |
|------|--------|-----|-------|-------|-----|------|
| >85% | '77.5% | 70% | 62.5% | 57.5% | 45% | <45% |

- 1 The mass of a rocket including fuel at take-off is 11 000 kg. The engines produce an upwards vertical thrust of 150 000 N.

The acceleration, in m s^{-2} , of the rocket at take-off is found using

- A $\frac{150\,000}{11\,000}$
- B $\frac{150\,000 - 11\,000}{11\,000}$
- C $\frac{150\,000 - (11\,000 \times 9.81)}{11\,000}$
- D $\frac{150\,000 - (11\,000 \times 9.81)}{(11\,000 \times 9.81)}$

(Total for Question = 1 mark)

- 2 A car of known mass has a constant acceleration. The resultant force acting on the car can be found by applying

- A Newton's first law
- B Newton's second law
- C Newton's third law
- D Stokes's law

(Total for Question = 1 mark)

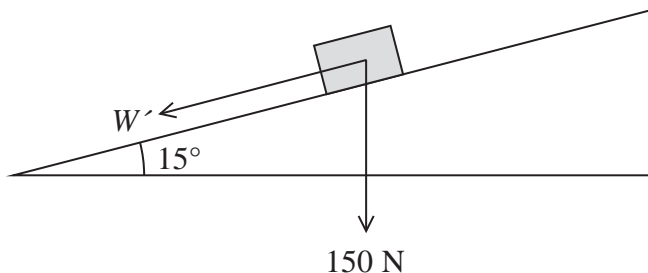
- 3 The gravitational field strength on Jupiter is 2.6 times greater than the gravitational field strength on Earth.

The weight of 10 kg of matter on Jupiter would be approximately

- A 26 N
- B 38 N
- C 98 N
- D 260 N

(Total for Question = 1 mark)

- 4 A box of weight 150 N is placed on an inclined plane. The component of the box's weight acting along the plane is W' .



W' in newtons is given by

- A $\frac{150}{\cos 15^\circ}$
- B $150 \times \cos 15^\circ$
- C $\frac{150}{\sin 15^\circ}$
- D $150 \times \sin 15^\circ$

(Total for Question = 1 mark)

- 5 A girl of mass 30 kg and a boy of mass 45 kg sit on a frictionless floor holding the two ends of a rope. The boy pulls on the rope. The girl moves towards the boy with an initial acceleration of 3 m s^{-2} .

The boy

- A moves towards the girl with an initial acceleration greater than 3 m s^{-2} .
- B moves towards the girl with an initial acceleration less than 3 m s^{-2} .
- C moves towards the girl with an initial acceleration of 3 m s^{-2} .
- D remains stationary.

(Total for Question = 1 mark)

- 6 On a newly discovered planet, an object of mass 8.0 kg has a weight of 60 N.

The gravitational field strength on this planet is

- A 0.13 N kg^{-1}
- B 7.5 N kg^{-1}
- C 9.8 N kg^{-1}
- D 480 N kg^{-1}

(Total for Question = 1 mark)

7 A person weighing 100 N stands on some bathroom scales in a lift. If the scales show a reading of 110 N, which answer could describe the motion of the lift?

- A Moving downwards and decelerating.
- B Moving downwards with a constant velocity.
- C Moving upwards and decelerating.
- D Moving upwards with a constant velocity.

(Total for Question = 1 mark)

8 A spring extends by 9 cm when a force of 6 N is applied. The limit of proportionality is not exceeded.

Another identical spring is joined end to end with this spring and a force of 4 N is applied.

The extension for the pair of springs is

- A 3 cm
- B 6 cm
- C 12 cm
- D 18 cm

(Total for Question = 1 mark)

9 A hollow plastic sphere and a solid metal sphere with the same diameter are released from rest in a vacuum.

Which of the following will be the same for both spheres after they have fallen through the same height?

- A the change in gravitational potential energy
- B their kinetic energy
- C the resultant force acting on them
- D their velocity

(Total for Question = 1 mark)