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

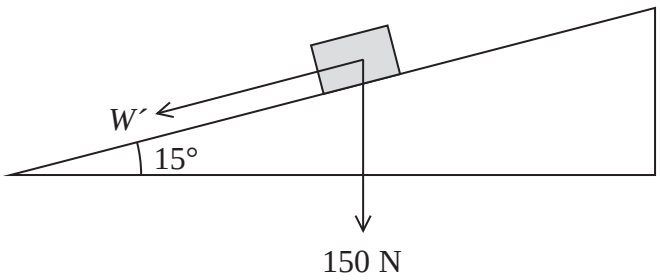
☒ **B** 38 N

☒ **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** $\frac{150}{\cos 15°}$

☒ **B** $150 \times \cos 15°$

☒ **C** $\frac{150}{\sin 15°}$

☒ **D** $150 \times \sin 15°$

(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 inital 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)