

Forces and Newton's laws – AS Mathematics P1**1. [June/2022/Paper_7356/01/No.12](#)**

A horizontal force of 30 N causes a crate to travel with an acceleration of 2 m s^{-2} , in a straight line, on a smooth horizontal surface.

Find the **weight** of the crate.

Circle your answer.

[1 mark]

15 kg

15gN

15 N

15g kg

2. [June/2022/Paper_7356/01/No.13](#)

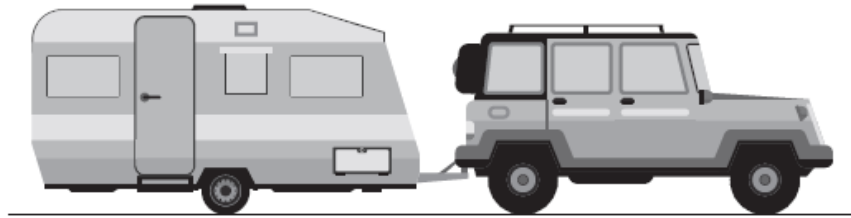
Two points A and B lie in a horizontal plane and have coordinates $(-2, 7)$ and $(3, 19)$ respectively.

A particle moves in a straight line from A to B under the action of a constant resultant force of magnitude 6.5 N

Express the resultant force in vector form.

[3 marks]

5. June/2022/Paper_7356/01/No.17



A car and caravan, connected by a tow bar, move forward together along a horizontal road.

Their velocity $v \text{ m s}^{-1}$ at time t seconds, for $0 \leq t < 20$, is given by

$$v = 0.5t + 0.01t^2$$

- (a) Show that when $t = 15$ their acceleration is 0.8 m s^{-2}

[2 marks]

- (b) The car has a mass of 1500 kg

The caravan has a mass of 850 kg

When $t = 15$ the tension in the tow bar is 800 N and the car experiences a resistance force of 100 N

- (b) (i) Find the total resistance force experienced by the caravan when $t = 15$

[2 marks]

(b) (ii) Find the driving force being applied by the car when $t = 15$

[3 marks]

(c) State one assumption you have made about the tow bar.

[1 mark]
