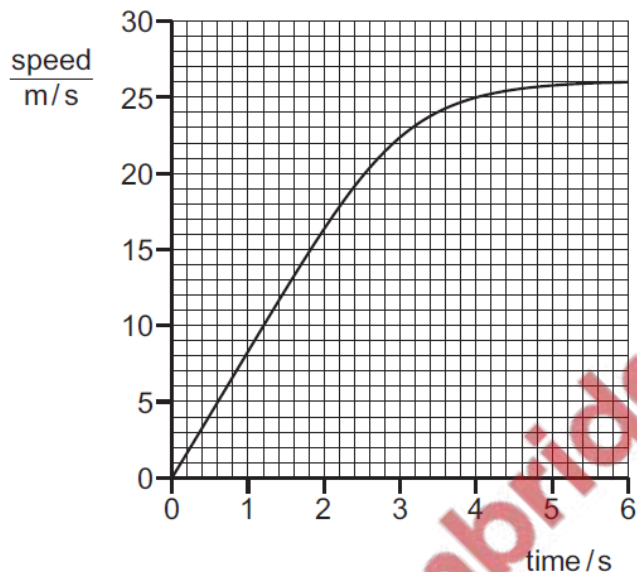# Motion/Kinematics – 2021 O Level 5054

1. Nov/2021/Paper_12/No.3

A skier slides down a slope.

The diagram shows how his speed varies with time.

What is his average acceleration during the 6.0 s?

A $2.2\,m/s^2$ **B** $4.3\,m/s^2$ **C** $8.0\,m/s^2$ **D** $13.0\,m/s^2$

2. Nov/2021/Paper_21/No.2c

(c) The lift accelerates upwards uniformly from rest for 4.0 s and then decelerates uniformly to rest in 4.0 s. The total distance travelled is 8.0 m.

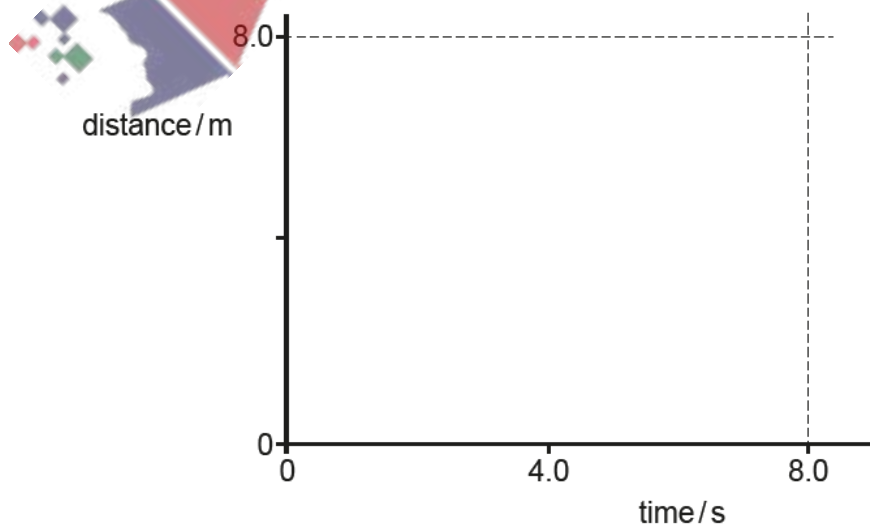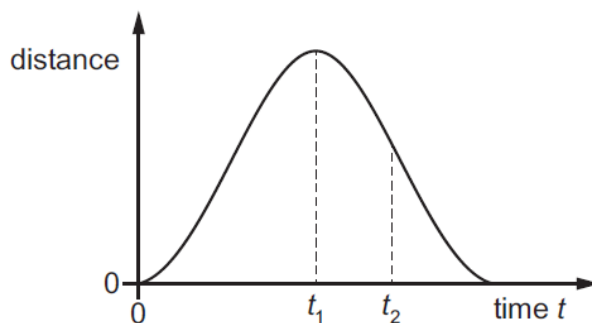On Fig. 2.2, sketch the distance-time graph for this journey.

Fig. 2.2

[3]

1

3.

A train sets off from a station at time $t = 0$. The graph shows how the distance between the train and the station varies with time.


Which statement about the movement of the train between time t_1 and t_2 is correct?

A Its speed is decreasing and it is moving away from the station.

B Its speed is decreasing and it is moving towards the station.

C Its speed is increasing and it is moving away from the station.

D Its speed is increasing and it is moving towards the station.

4.

A coin falls from rest through the air and eventually reaches a constant speed.

There is a resultant force acting on the coin due to the two forces P and Q shown in the diagram.
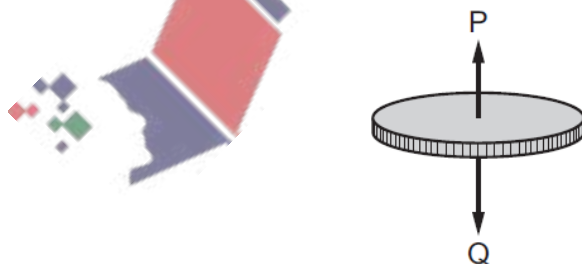
What happens to force P and what happens to the resultant force before the coin reaches constant speed?

	force P	resultant force
A	decreases	increases
B	decreases	decreases
C	increases	decreases
D	increases	increases

5. June/2021/Paper_22/No.2

A car approaches a set of traffic lights. The lights change to red at time $t = 0$.

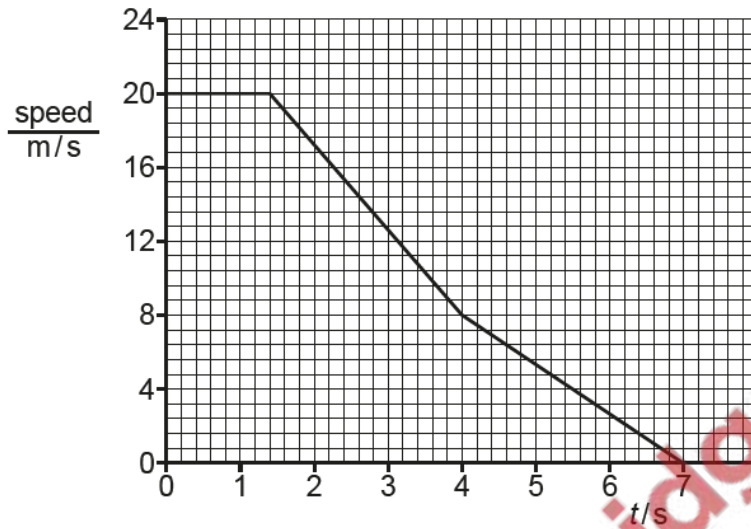Fig. 2.1 shows how the speed of the car changes with time.

Fig. 2.1

(a) The car starts to slow down a short time after the lights change to red.

Determine the time between the lights changing to red and the car starting to slow down.

.... [1]

(b) (i) State what is meant by *uniform acceleration*.

....

.... [1]

(ii) State how Fig. 2.1 shows that the deceleration of the car between $t = 2\,s$ and $t = 7\,s$ is *non-uniform*.

....

.... [1]

(c) Determine the distance the car travels from the moment the car starts to slow down until it stops.

distance = ... [3]