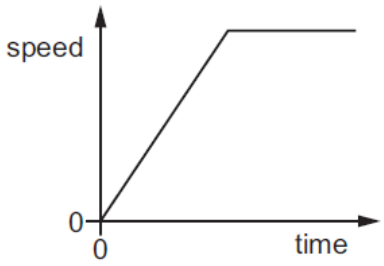
Motion – 2023 June O Level 5054

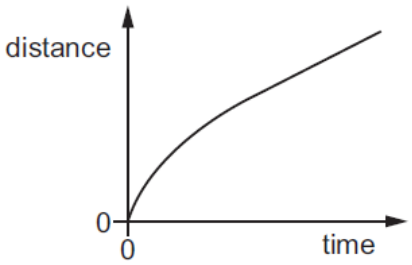
1. June/2023/Paper_ 5054/11/No.4

A speed–time graph for the journey of a car is shown.

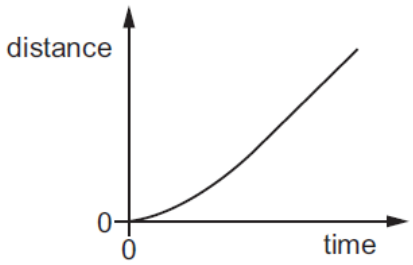


What is the distance–time graph for the journey?

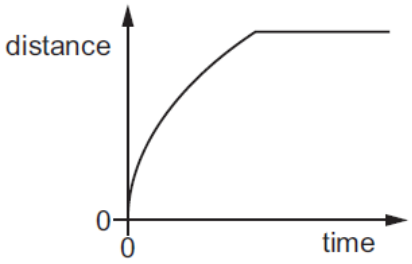
A



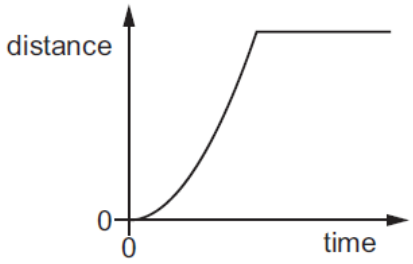
B



C

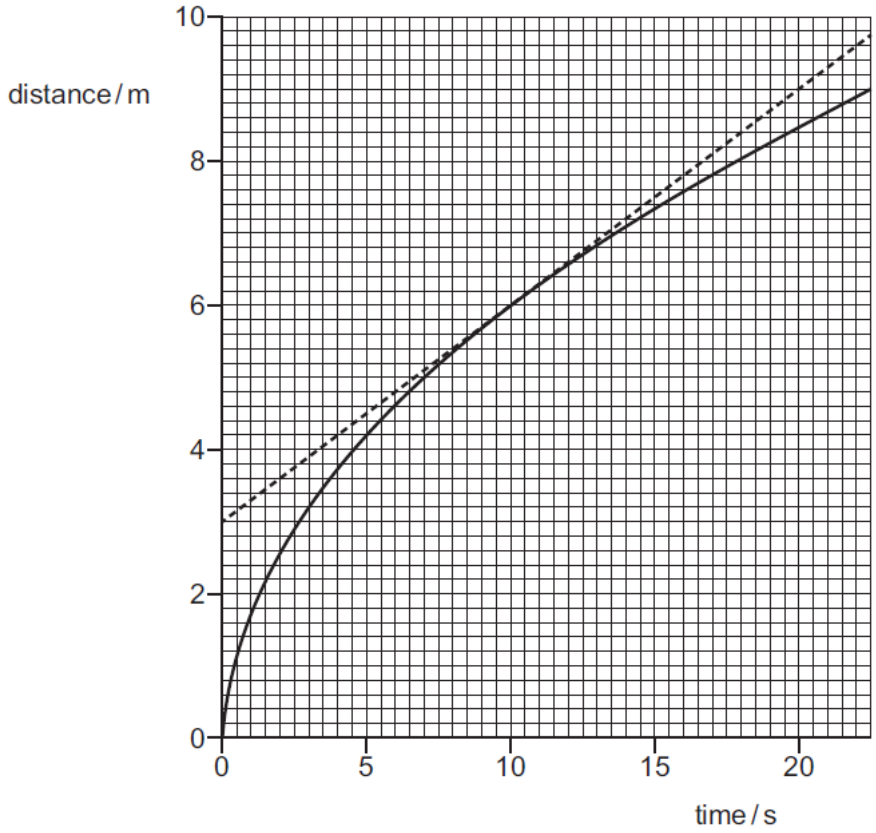


D



2. June/2023/Paper_ 5054/12/No.4

The curved line on the distance–time graph shows the motion of a toy car. The straight line is the tangent to the curve at 10 s.



What is the speed of the toy car at 10 s?

A 0.3 m / s **B** 0.6 m / s **C** 1.7 m / s **D** 3.3 m / s

3. June/2023/Paper_ 5054/12/No.9

The stopping distance of a car is the sum of the thinking distance and the braking distance.

Which factors affect the braking distance?

	speed of car	tiredness of driver	condition of road
A	✓	✗	✗
B	✓	✓	✓
C	✓	✗	✓
D	✗	✓	✓

key

✓ = affects braking distance

✗ = does not affect braking distance

4. June/2023/Paper_ 5054/21/No.1(a)

An aircraft pulls a glider along a runway as shown in Fig. 1.1.

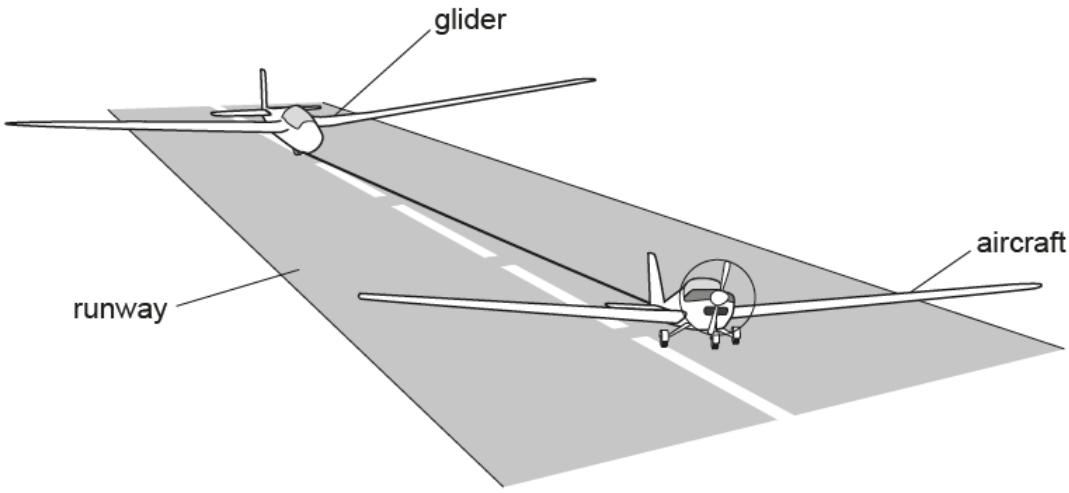


Fig. 1.1

Fig. 1.2 shows the speed of the glider during the first 12 s of the motion.

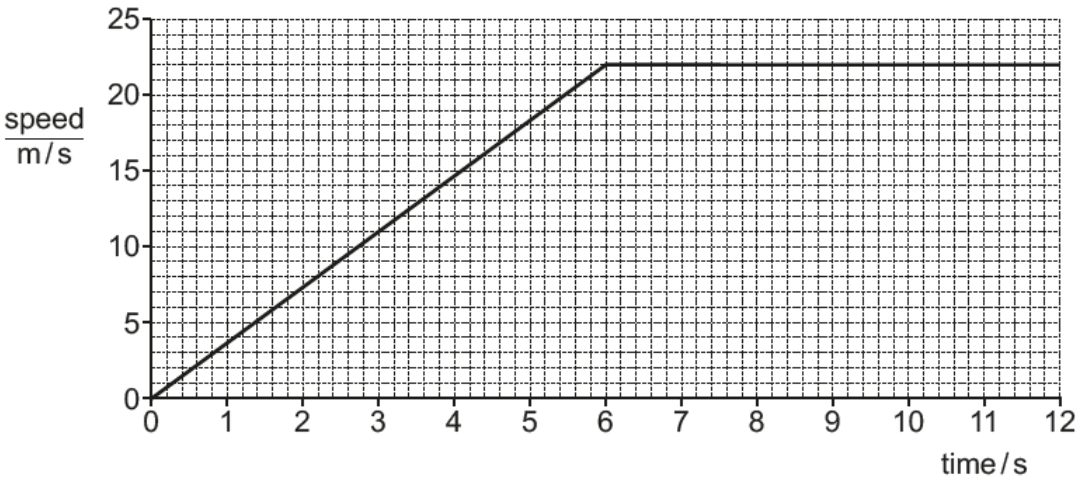


Fig. 1.2

(a) Describe the motion of the glider in the first 12 s.

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.....

..... [2]

5. June/2023/Paper_ 5054/22/No.1(a _ c)

Fig. 1.1 shows the speed–time graph for a car travelling on a straight horizontal road.

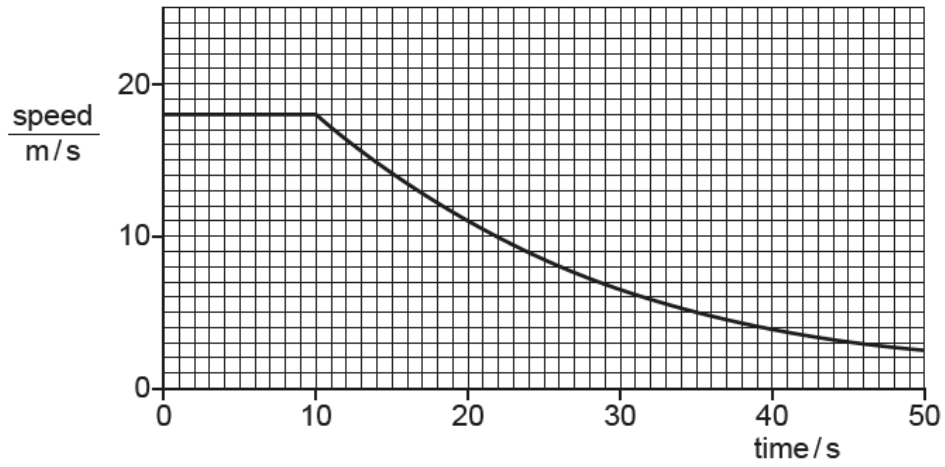

Fig. 1.1

(a) Describe the motion of the car shown in Fig. 1.1.

.....

.....

.....

..... [2]

(b) At time t = 10 s the engine of the car is switched off. The brakes are not applied.

(i) Name **two** forces that act on the car to cause the change in motion after t = 10 s.

1 .....

2 .....

[1]

(ii) Suggest why Fig. 1.1 is a curve after t = 10 s.

.....

.....

..... [1]

(c) Between $t = 10\,s$ and $t = 20\,s$ the speed of the car changes from $18\,m/s$ to $11\,m/s$.

The mass of the car is $1200\,kg$.

(i) Calculate the change in momentum of the car in this time.

Give the unit of your answer

momentum change = ... unit ..... [2]

(ii) Calculate the average resultant force exerted on the car during this time.

average resultant force = ... N [2]