PHYSICS 1A
Revision for Year 10

Revision

1 The boxes to show what can <u>increase</u> a driver's **reaction time**.

☐ drinking alcohol	☐ drinking coffee	☐ being wide-awake
☐ talking on the phone	☐ taking some medicines	☐ reading a map

2 Complete these sentences using words from the box.

The stopping _____ is how far a car travels between a driver seeing a _____ ahead and the car stopping. You can find the _____ distance of a car by adding the _____ and the _____.

braking distance	danger	distance	stopping	thinking distance

3 A car has a **thinking distance** of 15 m and a **braking distance** of 38 m. Calculate the **stopping distance**.

stopping distance = _____ m + _____ m = _____ m

4 Complete the sentences to show how different factors affect the stopping distance of a car.

a Stopping distance is made up of a _____ distance and a _____ distance.

b The greater the mass of a vehicle the _____ (longer/shorter) the stopping distance.

c The greater the _____, the longer the thinking and the braking distances.

d The shorter the driver's _____ time the shorter the _____ distance.

e Worn brakes will make the _____ (thinking/braking) distance _____ (longer/shorter).

f A slippery road will make the _____ (thinking/braking) distance _____ (longer/shorter)

g If the road surface is not wet or icy the _____ (thinking/braking) distance will be _____ (longer/shorter).

5 Explain why the speed of the car increases both the thinking distance and the braking distance.

_____

_____

_____

These words may help with your answer

alcohol	brakes	distracted	drugs	longer	reaction	seeing

5 A moving object with balanced forces on it will:

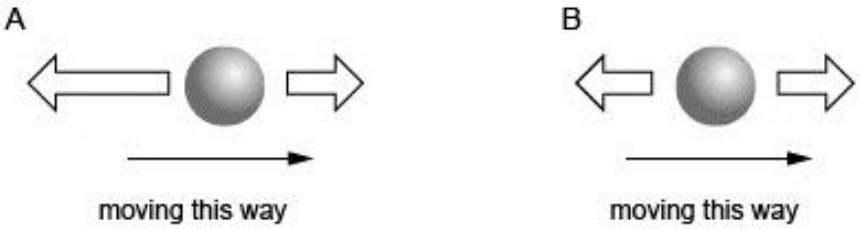
☐ speed up ☐ continue to move at the same speed ☐ slow down

6 Tick the forces that usually act on moving cars.

☐ weight ☐ magnetic force ☐ friction ☐ upthrust

☐ force from engine ☐ air resistance ☐ water resistance

The diagrams show two different sets of forces on an object.



7 **a** Which diagram shows balanced forces?

_____

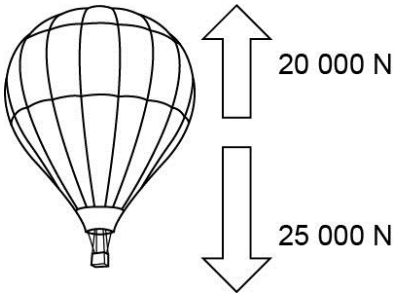
b Explain how you can tell that the forces are balanced. Use some of these words (**direction, opposite, same, size**) in your answer.

_____

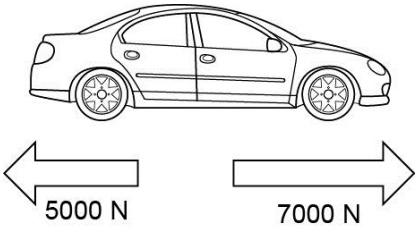
_____

8 Calculate the resultant forces on these objects.

a



b



9 A man is pushing a pushchair at a constant speed with a **force** of 20 N.

c Which is the best way to describe the force he is putting on the pushchair?

☐ 20 N in a forwards direction ☐ 20 N push ☐ 20 in a forwards direction

d Which is the best way of describing the **friction**?

☐ 20 N in the wheels ☐ 20 backwards ☐ 20 N in the opposite direction to the movement

10 The boxes show some different scientific **units**. Draw lines to join each unit to the measurement it is used for.

area
energy
force
length
mass
temperature
time
volume

degrees Celsius (°C)
joule (J)
kilogram (kg)
metre (m)
metres cubed (m^3)
metres squared (m^2)
newton (N)
second (s)

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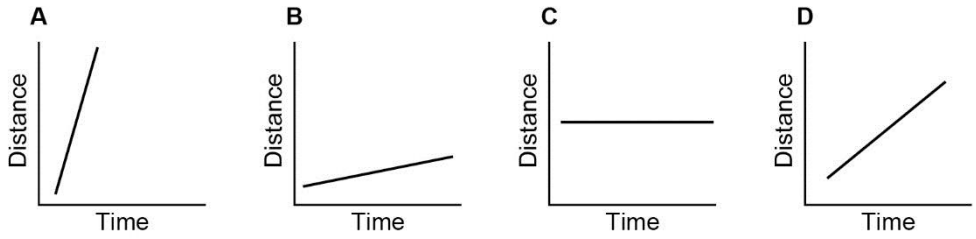
11 The four **distance/time graphs** below are all drawn with the same scales. They show different **speeds**.

e Write the speed under each graph. Choose the numbers from the box on the right.



0 m/s
2 m/s
4 m/s
6 m/s

speed = _____ speed = _____ speed = _____ speed = _____

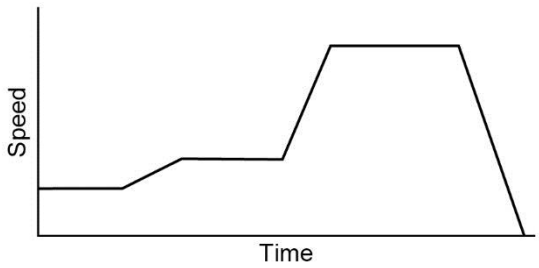
f Which graph shows the object has moved the greatest distance? Tick *one* box.

☐ A, because the line is steepest ☐ B, because the line is less steep

☐ A, because the line goes furthest up the distance axis ☐ C, because the line is horizontal

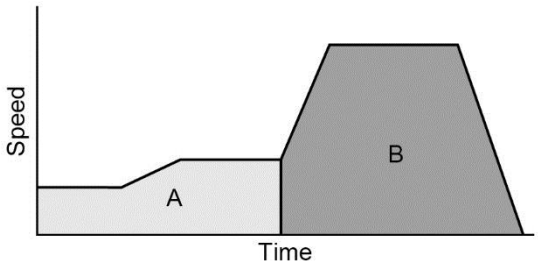
12 This is a **speed/time graph** for a cyclist. Draw lines to connect each label to the correct point on the graph.

constant slow speed
small **acceleration**
large acceleration



stopped
slowing down
constant fast speed

13 This is the same speed/time graph for the cyclist.



g Did the cyclist travel furthest in part A of her journey, or in part B? _____

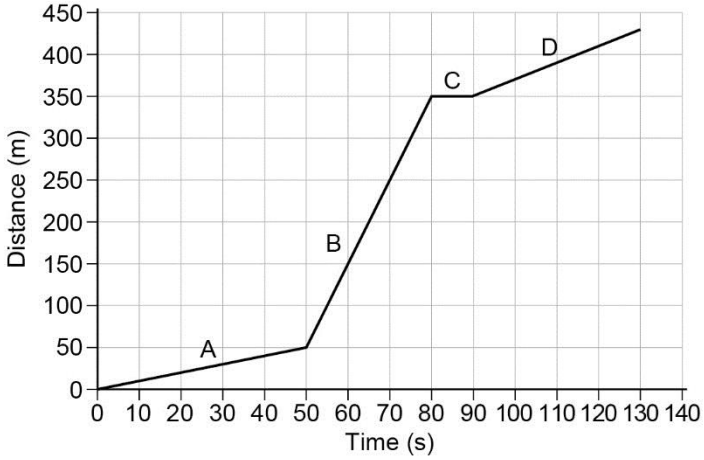
h Explain your answer.

_____

_____

_____

This is a **distance/time graph** for a cyclist travelling along a road.



14 a Which section of the graph shows where the cyclist waited at a junction?

_____

b For how long did the cyclist wait?

_____

15 a Which section of the graph shows where the cyclist was travelling the fastest? _____

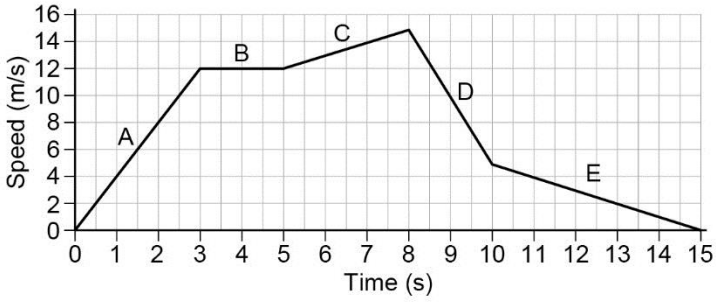
b How can you tell from the graph that the **speed** was fastest here?

_____

16 Part of the journey was uphill. Explain which part of the graph is likely to show the steepest part of the journey.

_____

This is a **speed/time graph** for a short car journey.



17 Which section or sections on the graph show the car:

i travelling at a constant speed

_____

j **accelerating** (speeding up)

_____

k **decelerating** (slowing down) _____

18 Explain how you can tell from the graph that the car travelled further during part C of the journey than it did during part A. You can draw on the graph to help you to explain.

_____

19 Write a typical speed next to each of these moving objects. Choose the speeds from the box below.

l car in town _____ **m** person walking _____ **n** aeroplane _____

1.5 m/s	10 m/s	250 m/s

20 Sophie walks 1800 m to school. It takes her 1500 seconds. Calculate her **average speed**.

average speed (m/s) = $\frac{\text{distance (m)}}{\text{time (s)}}$

Write the distance here.

average speed = $\frac{\_\_\_\_\_}{\_\_\_\_\_}$

Write the time here.

average speed = _____ m/s

Work out the answer (1800 ÷ 1500).

21 A car accelerates from 10 m/s to 20 m/s. It takes 8 seconds for this change of speed. Calculate the acceleration.

change in speed (m/s) = final speed (m/s) – starting speed (m/s)

= _____ m/s – _____ m/s

Write the final speed in the first space. Write the starting speed in the second space.

= _____ m/s

Work out the answer (20 − 10).

acceleration (m/s^2) = $\frac{\text{change in speed (m/s)}}{\text{time taken (s)}}$

Write the change in speed here.

acceleration = $\frac{\_\_\_\_\_}{\_\_\_\_\_}$

Write the time in here.

acceleration = _____ m/s^2

Work out the answer (10 ÷ 8).

22 Sophie walks 1800 m to school. It takes her 1500 seconds. Calculate her **average speed**.

speed = _____ m/s

23 The cyclist accelerates from 2 m/s to 10 m/s in 6 seconds. Calculate her acceleration.

acceleration = _____ m/s^2

24 At a set of traffic lights, a lorry slows down from 30 m/s to 0 m/s in 20 seconds. Calculate the acceleration.

acceleration = _____ m/s^2

change in speed = 0 m/s – 30 m/s

This will give you a negative value for the change in speed, and so the acceleration will also be negative.

This is correct, because the lorry is slowing down.