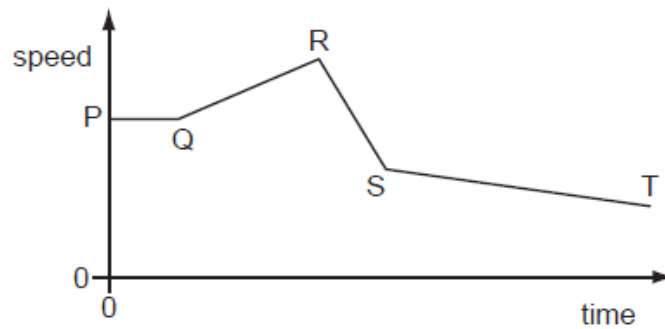# Revision: Forces and Motion

1.

The diagram shows the speed/time graph for a train as it travels along a track.

For which part of the graph is the train's speed changing at the greatest rate?

A PQ **B** QR **C** RS **D** ST

2.

A small steel ball is dropped from a low balcony.

Ignoring air resistance, which statement describes its motion?

A It falls with constant acceleration.

B It falls with constant speed.

C It falls with decreasing speed.

D It falls with increasing acceleration.

3.

Which is the unit for force and which is the unit for weight?

	force	weight
A	kg	kg
B	kg	N
C	N	kg
D	N	N

4.

A cup contains hot liquid.

Some of the liquid evaporates.

What happens to the mass and to the weight of the liquid in the cup?

	mass	weight
A	decreases	decreases
B	decreases	stays the same
C	stays the same	decreases
D	stays the same	stays the same

5.

A force acting on an object causes some properties of the object to change.

Which list contains **only** properties that can be changed by the action of the force?

A   mass, motion and shape

B   mass, motion and size

C   mass, shape and size

D   motion, shape and size

6.

A box is being moved by a fork-lift truck. The total weight of the box is 3000 N.

The force exerted by the fork-lift truck on the box is 3500 N upwards.

What is the resultant force on the box?

A   500 N downwards

B   500 N upwards

C   6500 N downwards

D   6500 N upwards

7.

A wind turbine can be seen through the window of the IGCSE Physics class laboratory, as shown in Fig. 1.1.

Fig. 1.1

The blades on the wind turbine are turning slowly, so a student uses a laboratory stopclock to time 40 rotations of the blades.

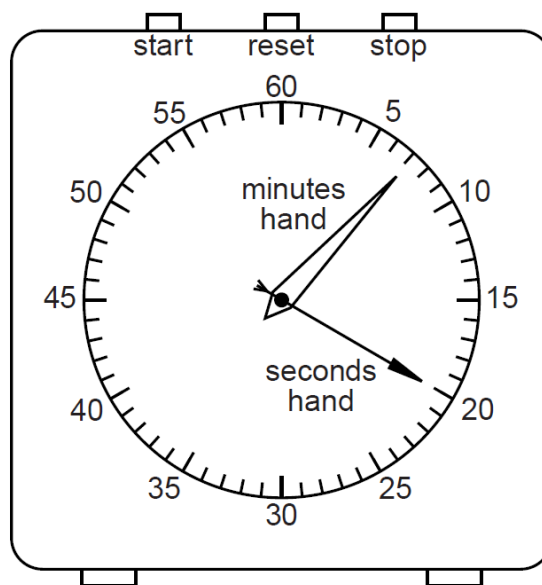Fig. 1.2 shows the stopclock after 40 rotations of the blades.

Fig. 1.2

(a) (i) State the reading on the stopclock.

reading = ... minutes .... seconds [1]

(ii) Calculate the time, in seconds, for one rotation of the blades.

time for one rotation = ... s [3]

(b) Later in the day, the blades of the wind turbine are found to take 15 s to rotate once.

The tip of the blade travels in a circle of circumference 75 m.

Calculate the average speed of the tip of the blade.

average speed = ... m/s [3]

8.

A train has a total mass of 7.5×10^5 kg.

The train accelerates from rest at a constant rate along a straight, horizontal track. It reaches a speed of 24 m/s in 60 s.

Calculate

(i) the train's acceleration,

acceleration = ... [2]

(ii) the resultant force acting on the train.

force = ... [2]

9.

Which person is experiencing an acceleration?

A a driver of a car that is braking to stop at traffic lights

B a passenger in a train that is stationary in a railway station

C a shopper in a large store ascending an escalator (moving stairs) at a uniform rate

D a skydiver falling at constant speed towards the Earth

10.

A car travels at various speeds during a short journey.

The table shows the distances travelled and the times taken during each of four stages P, Q, R and S.
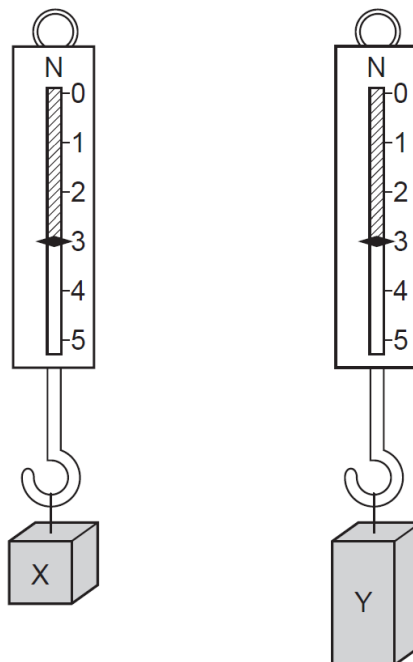
stage	P	Q	R	S
distance travelled / km	1.8	3.6	2.7	2.7
time taken / minutes	2	2	4	3

During which two stages is the car travelling at the same average speed?

A P and Q   **B** P and S   **C** Q and R   **D** R and S

11.

Two blocks of metal X and Y hang from spring balances, as shown in the diagrams.

What does the diagram show about X and Y?

A   They have the same mass and the same volume but different weights.

B   They have the same mass and the same weight but different volumes.

C   They have the same mass, the same volume and the same weight.

D   They have the same weight and the same volume but different masses.

12.

A 1 kg sample of aluminium is stored in a laboratory. In a different laboratory, in the same town, there is a 1 kg sample of iron.
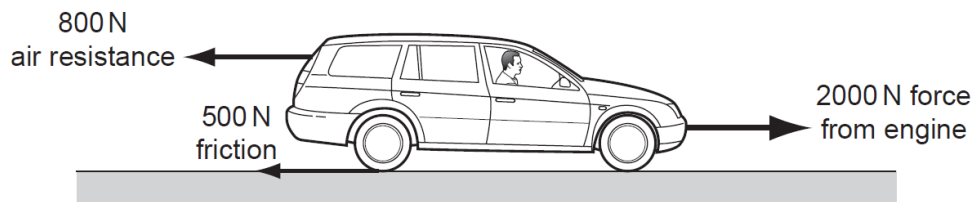
Which quantity must these two samples **always** have in common?

A   the same density

B   the same temperature

C   the same volume

D   the same weight

13.

A car moves along a level road.

The diagram shows all of the horizontal forces acting on the car.

Which statement is correct?

A   The car is slowing down.

B   The car is speeding up.

C   The car is moving at a constant speed.

D   The car is moving backwards.