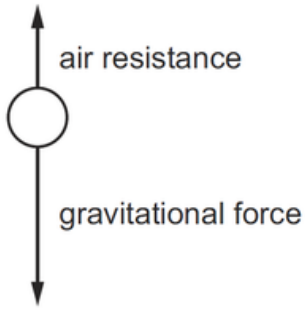
Question 1

A ball falls from rest through the air towards the ground. The diagram shows two forces acting on the ball.



As the ball falls, the air resistance increases.

Which statement is correct?

A The acceleration of the ball decreases.

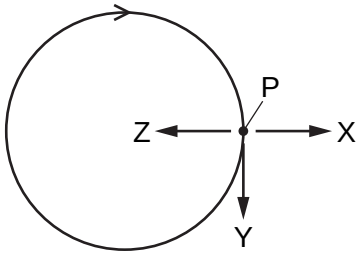
B The acceleration of the ball increases.

C The speed of the ball decreases.

D The gravitational force on the ball decreases.

Question 2

An object moves at constant speed in the circular path shown.



Which statement about the acceleration of the object when it is at point P is correct?

A The acceleration is in the direction of arrow X.

B The acceleration is in the direction of arrow Y.

C The acceleration is in the direction of arrow Z.

D The object is not accelerating.

Question 3

Four objects are moving in a straight line.

The table shows the distances moved by each object in each second of its motion.

Which object is moving with constant non-zero acceleration?

	distance moved in 1st second/m	distance moved in 2nd second/m	distance moved in 3rd second/m	distance moved in 4th second/m
A	5	5	5	5
B	5	6	7	8
C	5	7	10	14
D	5	8	14	26

Question 4

The drag force on a car increases with speed. At 20 m/s, the total drag force is 400 N. The mass of the car is 1200 kg and the driving force is constant at 700 N.

Which statement about the acceleration of the car at 20 m/s is correct?

A The acceleration is 0.25 m/s^2 but will decrease as time passes.

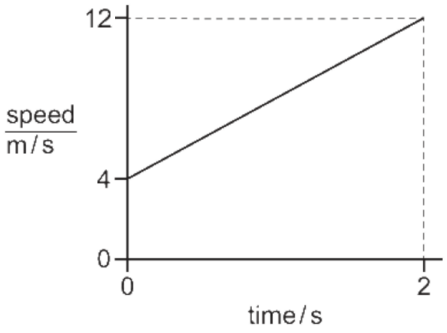
B The acceleration is 0.25 m/s^2 but will increase as time passes.

C The acceleration is 0.58 m/s^2 but will decrease as time passes.

D The acceleration is 0.58 m/s^2 but will increase as time passes.

Question 5

The diagram shows the speed–time graph for a car.



What is the acceleration of the car?

A $4.0\,m/s^2$ **B** $6.0\,m/s^2$ **C** $16\,m/s^2$ **D** $24\,m/s^2$

Question 6

What is the relationship between the force F on an object, its mass m and its acceleration a?

A $a = \frac{m}{F}$ **B** $a = F \times m$ **C** $m = \frac{F}{a}$ **D** $m = F \times a$

Question 7

Which statement about acceleration is correct?

A It is related to the changing speed of an object.

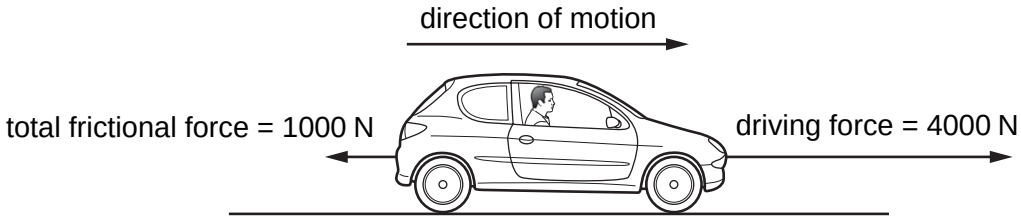
B It is the distance an object travels in one second.

C It is the force acting on an object divided by the distance it travels in one second.

D It is the force acting on an object when it is near to the Earth.

Question 8

A car of mass 1200 kg is travelling along a horizontal road.



What is the acceleration of the car?

A 0.83 m / s² **B** 1.2 m / s² **C** 2.5 m / s² **D** 3.3 m / s²

Question 9

A speed–time graph is used to describe the motion of an object.

Which quantities are calculated from the gradient of the graph and from the area under the graph?

	gradient of the graph	area under the graph
A	acceleration	distance travelled
B	acceleration	total journey time
C	distance travelled	acceleration
D	total journey time	distance travelled

Question 10

On the Moon, all objects fall with the same acceleration.

Which statement explains this?

A On the Moon, all objects have the same weight.

B The Moon has a smaller gravitational field strength than the Earth.

C The weight of an object is directly proportional to its mass.

D The weight of an object is inversely proportional to its mass.

Question 11

Which quantity is equal to acceleration?

A area under a distance-time graph

B area under a speed–time graph

C gradient of a distance-time graph

D gradient of a speed–time graph