

Question 1

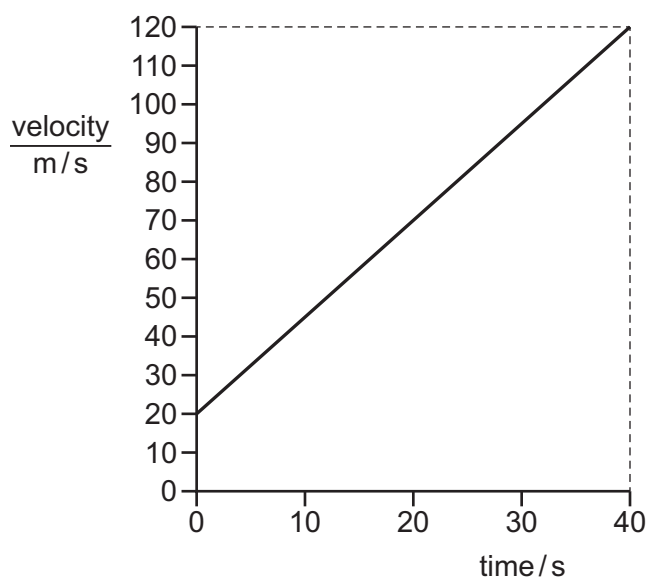
On the Moon, all objects fall with the same acceleration.

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 2

The diagram shows a velocity–time graph for an object which is accelerating.

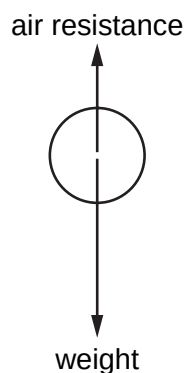


What is the acceleration of the object?

- A** 0.40 m/s^2 **B** 2.5 m/s^2 **C** 3.0 m/s^2 **D** 100 m/s^2

Question 3

The diagram shows the vertical forces acting on a ball as it falls vertically through the air. The ball does not reach terminal velocity.

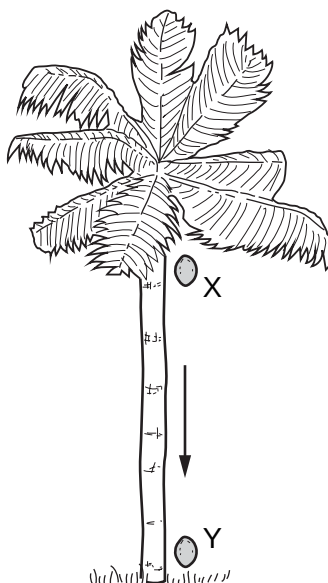


Which row describes what happens to the resultant force on the ball and what happens to the acceleration of the ball as it falls through the air?

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

Question 4

A coconut falls from a palm tree. At X, it has just started falling. Y is the point just before it hits the ground.



What is the acceleration of the coconut at X?

(Air resistance can be ignored.)

- A zero
- B less than that at Y
- C the same as that at Y
- D more than that at Y

Question 5

An object of mass 1.0 kg is at rest on the Earth. An identical object is at rest on a planet with a gravitational field strength of twice that on the Earth.

Which row correctly compares the object on the planet to the object on the Earth?

	its weight	its acceleration when the same horizontal resultant force is applied
A	double	equal to that on the Earth
B	double	half that on the Earth
C	half	equal to that on the Earth
D	half	half that on the Earth

Question 6

An object is falling in a uniform gravitational field.

After a certain time, it reaches terminal velocity.

Which row is correct?

	velocity of object	acceleration of object
A	increases then decreases	positive then negative
B	increases then decreases	positive then zero
C	increases then constant	positive then negative
D	increases then constant	positive then zero

Question 7

A ball is at rest on the ground. A boy kicks the ball. The boy's boot is in contact with the ball for a time of 0.040 s.

The average force on the ball is 200 N. The ball leaves the boy's boot with a speed of 20 m/s.

Which row gives the impulse of the boot on the ball and the average acceleration of the ball during the time of 0.040 s?

	impulse on ball Ns	average acceleration of ball m/s ²
A	8	0.8
B	8	500
C	5000	0.8
D	5000	500

Question 8

A 0.15 kg mass is suspended from a vertical spring.

The mass is pulled downwards until the spring has extended by 12 cm from its unstretched length.

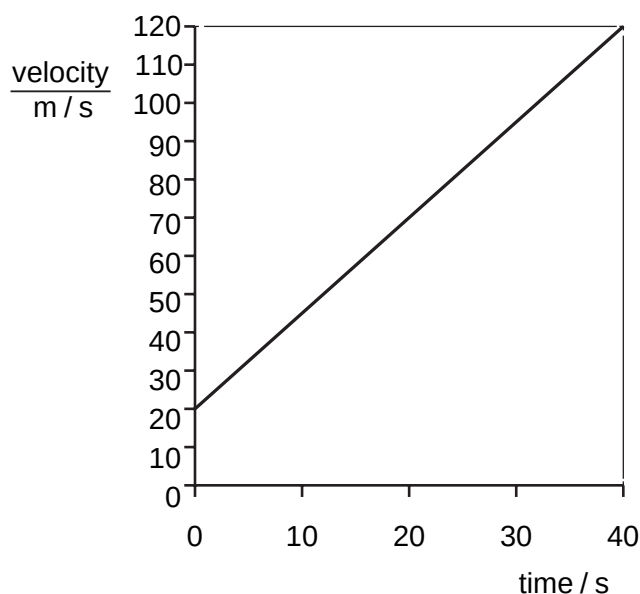
The spring constant of the spring is 30 N/m.

What is the magnitude of the initial acceleration of the spring when it is released?

- A** 14 m/s² **B** 24 m/s² **C** 28 m/s² **D** 34 m/s²

Question 9

The diagram shows a velocity–time graph for an object which is accelerating.



What is the acceleration of the object?

- A** 0.40 m / s^2 **B** 2.5 m / s^2 **C** 3.0 m / s^2 **D** 100 m / s^2

Question 10

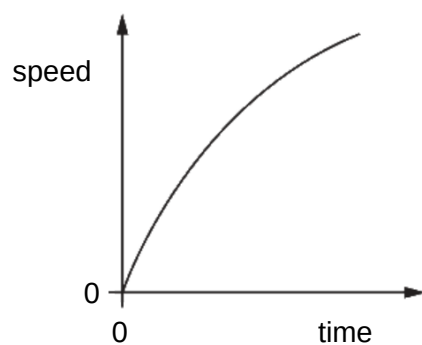
An object of mass 1.0 kg is at rest on Earth. An identical object is at rest on a planet with a gravitational field strength of twice that on Earth.

Which row correctly compares the object on the planet to the object on Earth?

	its weight	its acceleration when the same horizontal force is applied
A	double	equal to that on Earth
B	double	half that on Earth
C	half	equal to that on Earth
D	half	half that on Earth

Question 11

The diagram shows a speed-time graph for a moving object.



Which description of the object's motion is correct?

- A** decreasing acceleration
- B** decreasing speed
- C** constant acceleration
- D** constant speed