

GCSE Physics A (Gateway)

J249/01 Physics A P1-P4 and P9 (Foundation Tier)

Question Set 26

Multiple Choice Questions

P2: Forces

1 A bus takes 1.8 hours to travel 24 km.

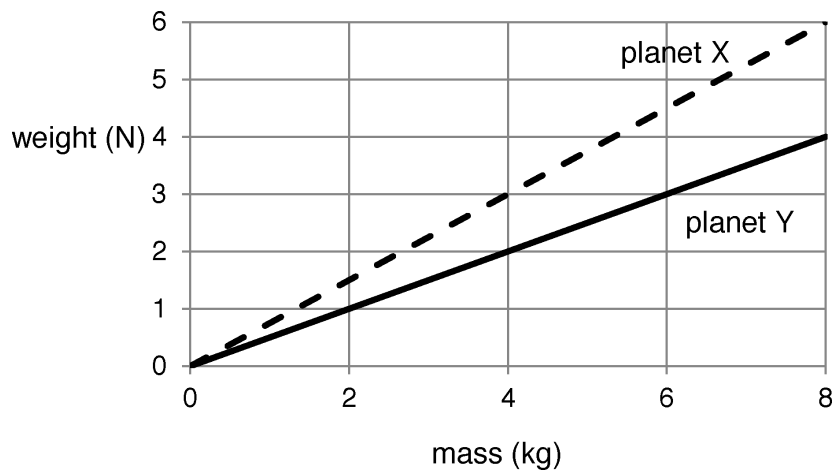
What is the average speed of the bus?

- A 43.2 km/h
- B 25.8 km/h
- C 22.2 km/h
- D 13.3 km/h

Your answer

[1]

2 The graph shows the relationship between mass and weight on two different planets.



The weight of an object on planet X is 3.0 N.

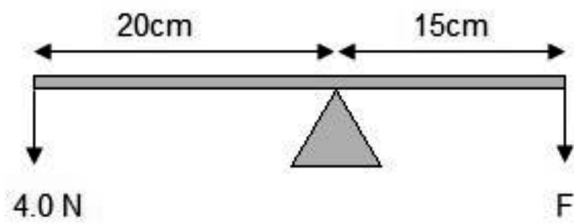
What is the weight of the same object on planet Y?

- A 1.5 N
- B 2.0 N
- C 4.0 N
- D 6.0 N

Your answer

[1]

- 3 A see-saw is in equilibrium.



What is the value of force F?

- A 3.0 N
- B 3.5 N
- C 5.0 N
- D 5.3 N

Your answer

[1]

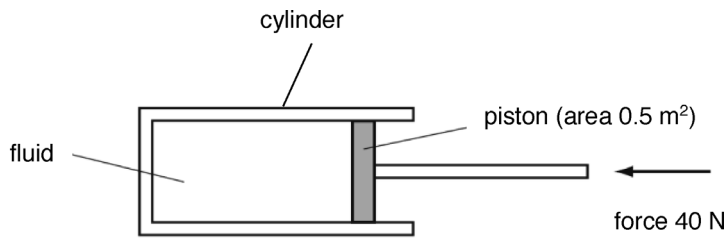
- 4 Which sentence is the definition of the power of a machine?

- A The amount of work done by the machine.
- B The efficiency of the machine.
- C The number of joules of energy the machine requires to work.
- D The rate at which energy is transferred by the machine.

Your answer

[1]

- 5 A piston is pushed in a cylinder containing a fluid.



pressure = force ÷ area.

What is the pressure on the fluid?

- A 20 Pa
- B 80 Pa
- C 160 Pa
- D 200 Pa

Your answer

[1]

- 6 A firework rocket has a mass of 0.1 kg.
A resultant force of 2 N acts on the rocket.

What is the acceleration of the rocket?

- A 0.2 m/s²
- B 0.5 m/s²
- C 20 m/s²
- D 200 m/s²

Your answer

[1]

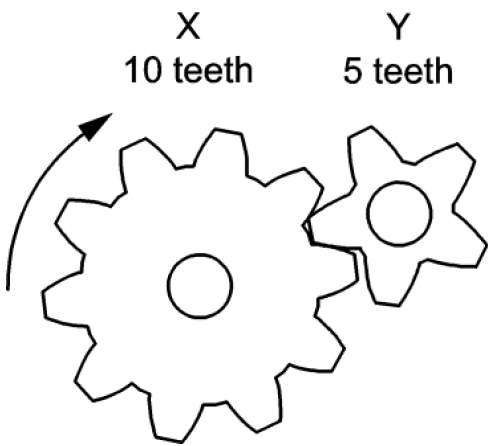
7 What is the **minimum** number of forces needed to compress a spring?

- A 1
- B 2
- C 3
- D 4

Your answer

[1]

8 The diagram shows 2 gears.



Gear **X** is rotated clockwise at 1.0 rotation per second.

Which row describes the movement of gear **Y**?

	direction of rotation	rotations per second
A	anticlockwise	0.5
B	anticlockwise	2.0
C	clockwise	0.5
D	clockwise	2.0

Your answer

[1]

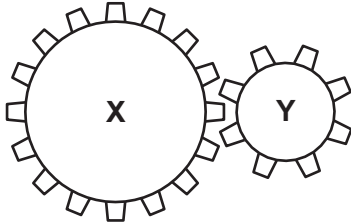
9 What is the gravitational field strength at the Earth's surface?

- A 10 N/kg
- B 16 N/kg
- C 50 N/kg
- D 230 N/kg

Your answer

[1]

10 Cog X has 16 teeth and cog Y has 8 teeth.



Cog X is turned around **two** times.

How many times does cog Y turn around?

- A 1
- B 2
- C 4
- D 8

Your answer

[1]

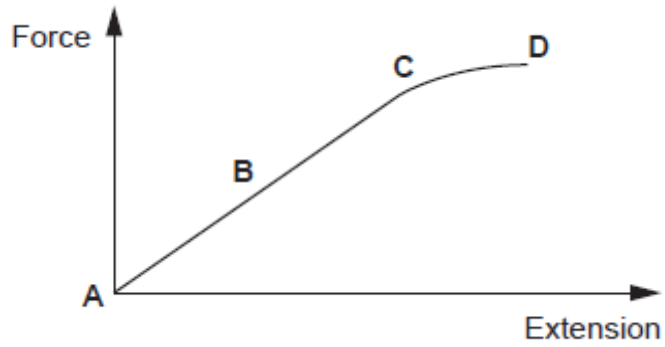
11 What is the **smallest** number of forces needed to bend an object?

- A 1
- B 2
- C 3
- D 4

Your answer

[1]

12 The diagram shows the relationship between force and extension for a spring.



Which letter on the graph shows the **elastic limit** of the spring being stretched?

Your answer

[1]

13 An object travelled 800 m in 40 seconds.

Use the equation: distance travelled (m) = speed (m/s) \times time (s)

What is the speed of the object?

- A 0.05 m/s
- B 20 m/s
- C 840 m/s
- D 32000 m/s

Your answer

[1]

14 An object moved 20 cm with a force of 20 N.

Use the equation: work done = force \times distance

Which is the correct calculation of work done?

- A** 0.4 J
- B** 4.0 J
- C** 40 J
- D** 400 J

Your answer

[1]

15 In which situation does the force cause a rotation?

- A** Bouncing on a trampoline
- B** Hitting a nail with a hammer
- C** Pushing a friend on a swing
- D** Sitting on a chair

Your answer

[1]

16 Which is a scalar?

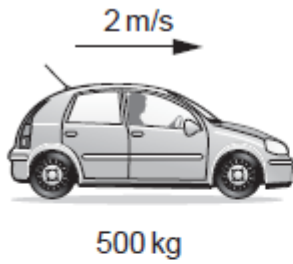
- A** Acceleration
- B** Displacement
- C** Force
- D** Speed

Your answer

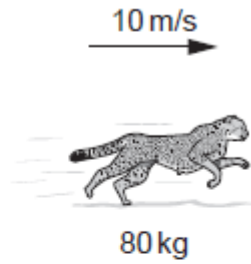
[1]

17 Which of the following has the **most** kinetic energy?

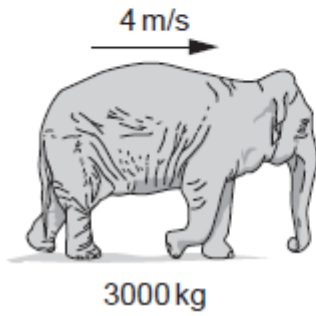
A



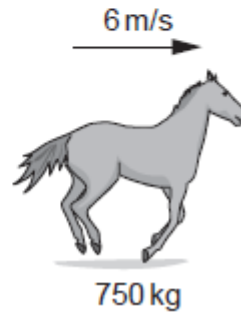
B



C



D



Your answer

[1]

18 Which distances are the **same**?

A 1×10^{-3} m and 1 μ m

B 1×10^{-6} m and 1 mm

C 1×10^{-9} m and 1 nm

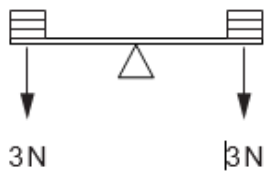
D 1×10^{-12} m and 1 Gm

Your answer

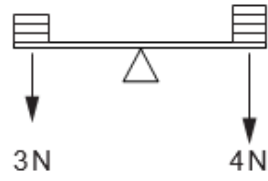
[1]

19 A student puts different weights on four balances.

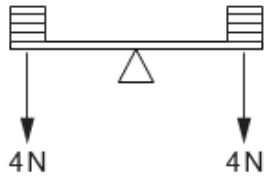
A



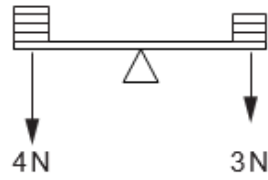
B



C



D

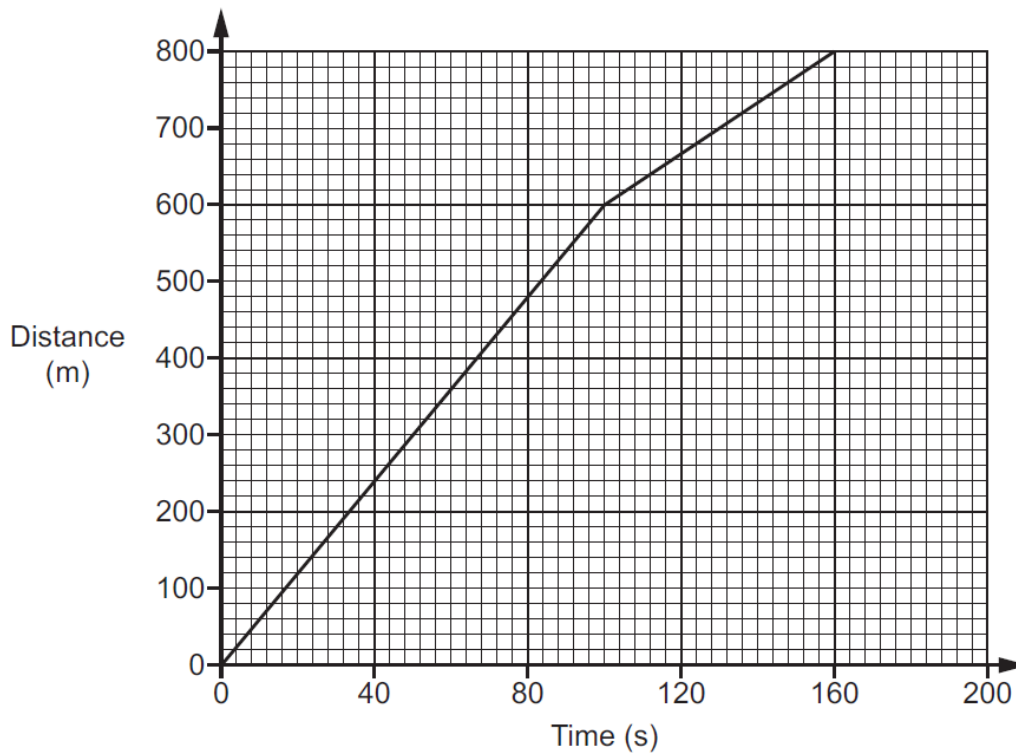


Which balance will give a **clockwise** moment?

Your answer

[1]

20 Look at the distance-time graph for a journey to school.



What is the average speed for the journey?

Use the equation: average speed = distance travelled \div time

- A 0.2 m/s
- B 5.0 m/s
- C 6.0 m/s
- D 50 m/s

Your answer

[1]

21 Which of the following is Newton's Third Law?

- A For every action there is an equal and opposite reaction.
- B What goes up must come down.
- C The acceleration that a resultant force produces depends on the size of the force and mass of the object.
- D An object will continue to stay at rest or move with uniform speed unless a force acts on it.

Your answer

[1]

22 On Mars the gravitational field strength is 4.0 N / kg.

How much would a 60 kg person weigh on Mars?

Use the equation: weight = mass × gravitational field strength

A 15 N

B 64 N

C 240 N

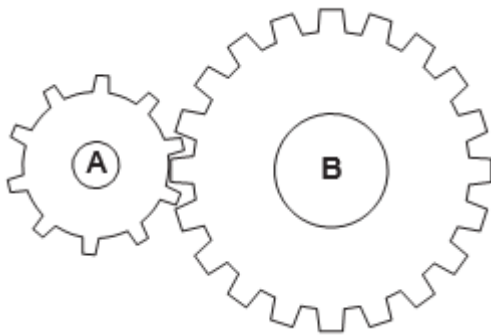
D 600 N

Your answer

[1]

23 A student sets up two cogs.

Cog **A** has 10 teeth and cog **B** has 20 teeth.



Cog **A** is turned **2** times.

How many times does cog **B** turn?

A 0.5 times

B 1 time

C 2 times

D 20 times

Your answer

[1]

24 A car travels at 72 km / h.

How fast is this in metres per second (m / s)?

- A** 1.2 m/s
- B** 20 m/s
- C** 120 m/s
- D** 1200 m/s

Your answer

[1]

25 Which one of the following uses of forces causes a rotation?

- A** Lowering a book vertically from a shelf
- B** Opening a door
- C** Lifting a book vertically onto a shelf
- D** Sitting in the centre of a see-saw

Your answer

[1]

Total Marks for Question Set 26: 25

Equations in physics

$$(\text{final velocity})^2 - (\text{initial velocity})^2 = 2 \times \text{acceleration} \times \text{distance}$$

$$\text{change in thermal energy} = \text{mass} \times \text{specific heat capacity} \times \text{change in temperature}$$

$$\text{thermal energy for a change in state} = \text{mass} \times \text{specific latent heat}$$

$$\text{energy transferred in stretching} = 0.5 \times \text{spring constant} \times (\text{extension})^2$$

$$\text{potential difference across primary coil} \times \text{current in primary coil} = \text{potential difference across secondary coil} \times \text{current in secondary coil}$$

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