

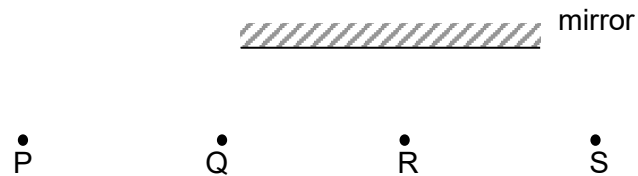


2026 Sec 3 Physics Revision Exercise (MCQ)

Name: () Class: 3/ Date:

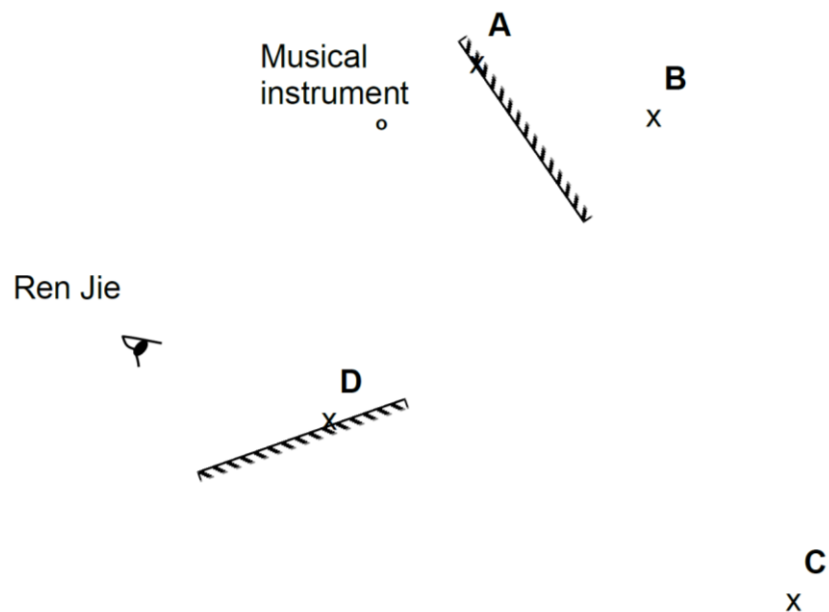
Optics

- 1 Four students, P, Q, R and S, are standing in front of a plane mirror as shown below.



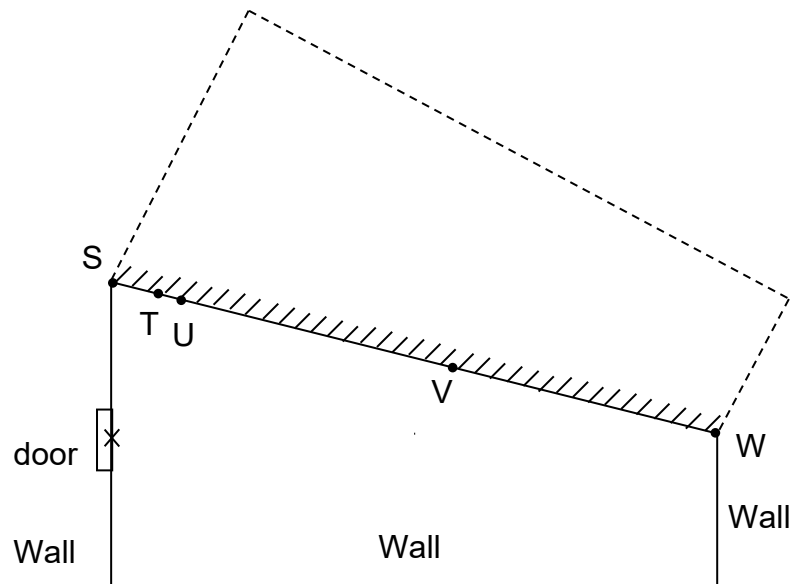
Who can Q see in the mirror?

- A P and Q only
 - B Q and R only
 - C R and S only
 - D P and S only
- 2 Ren Jie was looking through the mirror at his musical instrument.



Where is the position of the image of musical instrument?

- 3 A room has an odd shape and with a mirror covering the biggest side of the wall. The diagram shows the top view of the room and the image of the walls 1, 2 and 3 is represented by the dotted lines.

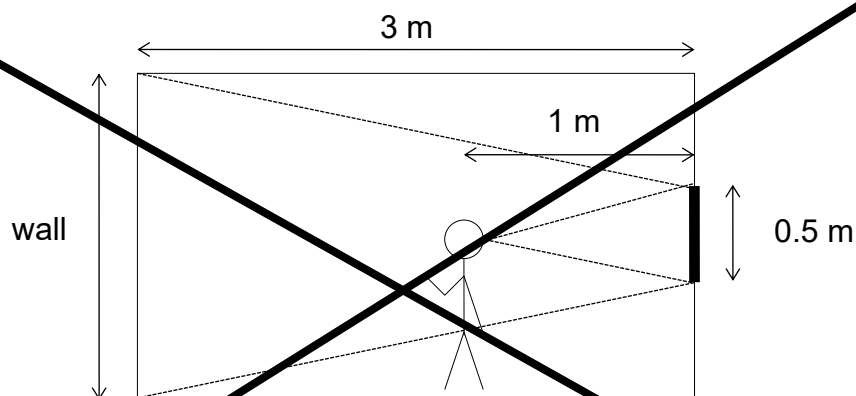


A person represented by a cross wants to see all the images of the walls of the room and uses the **smallest** length of the mirror.

What is the correct length?

- A TU B UV C TV D SW

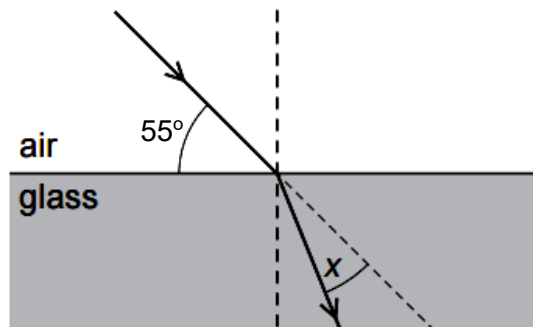
- 4 The diagram (not to scale) shows a man standing 1 m from a mirror of height 0.5 m. He notices that the reflection of the wall behind exactly fills the mirror.



How high is the wall?

- A 1.0 m
B 1.5 m
C 2.0 m
D 3.0 m

- 5 A ray of light enters a glass block at an angle of 55° with the boundary (surface).

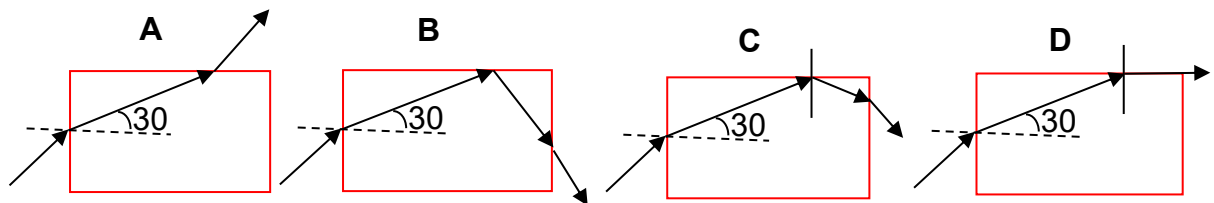


The refractive index of the glass is 1.5. The light ray changes direction when entering the glass.

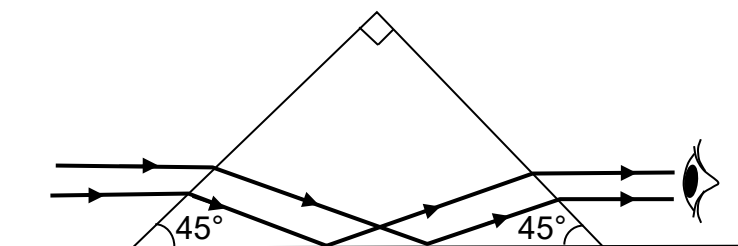
What is the angle x through which the ray moves?

- A** 1.9° **B** 12.5° **C** 22.5° **D** 33.1°
- 6 A ray of light from air passes through a block of glass which has a refractive index 1.5.

Which diagram correctly shows the path of light entering and leaving the glass block?



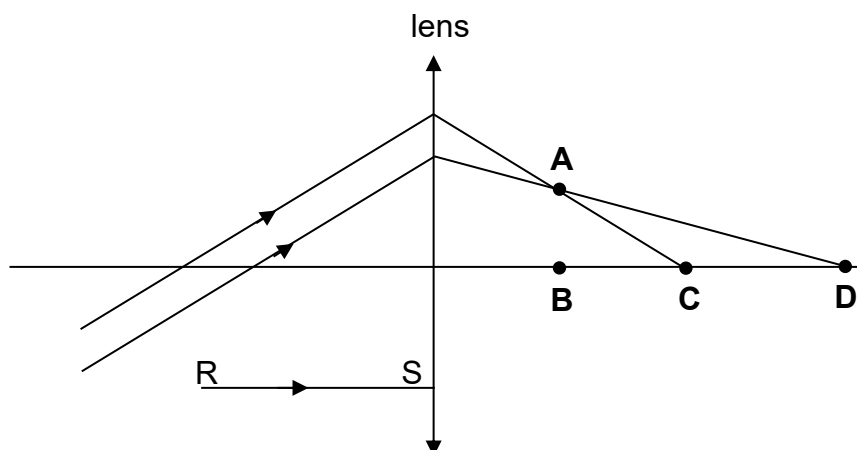
- 7 Two parallel rays of light pass through an isosceles glass prism with a refractive index of 1.5.



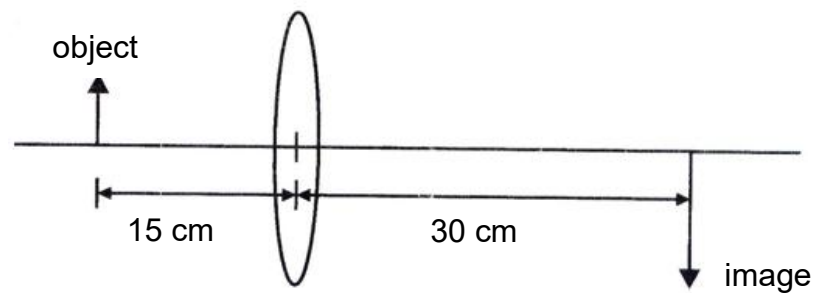
statement	
1	Total internal reflection occurs at the base of the prism.
2	An object viewed through this prism in this way will appear upside down.
3	The critical angle for the glass prism is more than 45° .

Which of the following combination of statements are **true**?

- A** 1 and 2
B 1 and 3
C 2 and 3
D 1, 2 and 3
- 8 What are the characteristics of an image formed by the thin converging lens in the human eye?
- A** real, inverted and diminished
B real, upright and diminished
C virtual, inverted and diminished
D virtual, upright and magnified
- 9 The diagram shows two parallel rays of light passing through a converging lens. Through which point will the light ray RS pass after passing through the lens?



- 10 When an object is placed 15 cm in front of a convex lens, the image is formed 30 cm behind the lens.



How would the size of the image and the image distance change when the object is moved 5 cm further away from the lens?

	size of image	image distance
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

Answers

1. C
2. C
3. D
4. C
5. B
6. C
7. A
8. A
9. B
10. A

Units and Measurements, Kinematics, Dynamics

1 Which pair of physical quantities consists of two vectors?

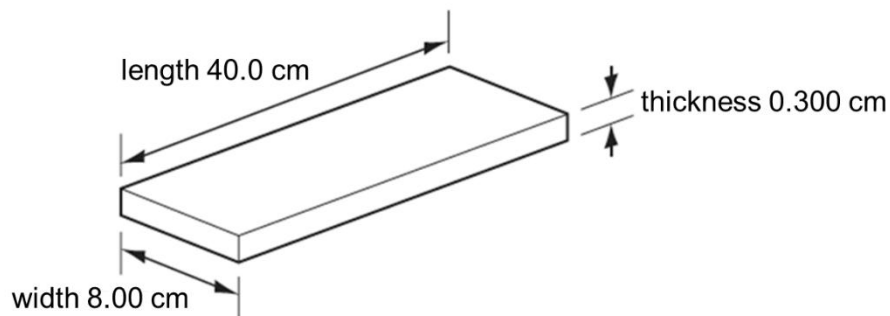
- A kinetic energy and force
- B moment and time
- C velocity and acceleration
- D weight and temperature

2 The thickness of a piece of metal is measured with a micrometer.

Which reading shows the correct precision of the reading recorded?

- A 1 cm B 1.1 cm C 1.10 cm D 1.100 cm

3 A manufacturer needs to measure accurately the dimensions of a wooden floor tile. The approximate dimensions of the tile are as shown.



Which instruments measure each of these dimensions accurately?

	width	length	thickness
A	digital calipers	meter rule	micrometer
B	meter rule	digital calipers	micrometer
C	meter rule	micrometer	digital calipers
D	micrometer	meter rule	digital calipers

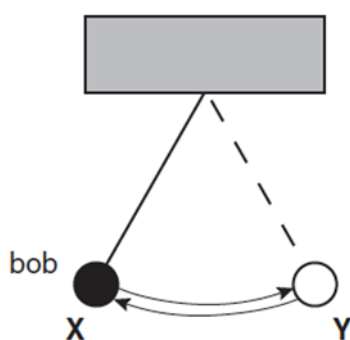
4 A simple pendulum is 1.0 m long and carries a 50 g bob.

It swings with a period of 0.80 s.

If the 50 g bob is replaced by a 100 g bob, how long does the new pendulum take to complete 1 swing?

- A 0.40 s B 0.80 s C 1.6 s D 3.2 s

- 5 The pendulum as shown makes 10 complete oscillations in 40 seconds.

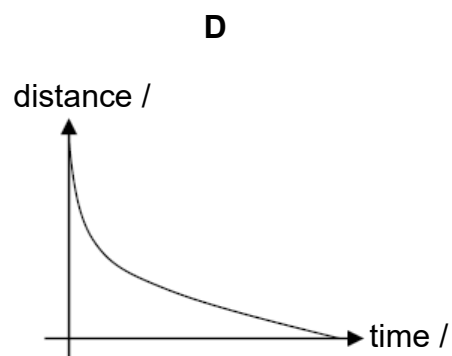
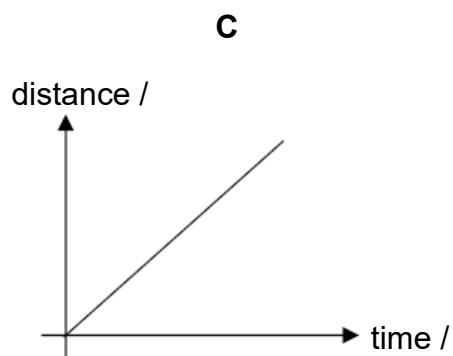
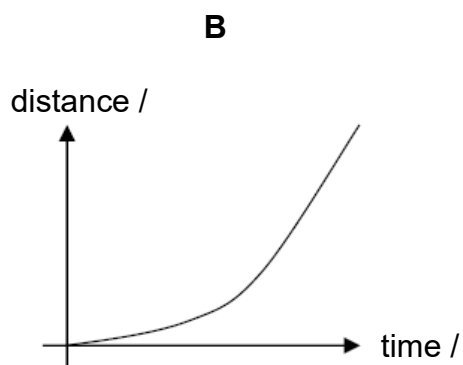
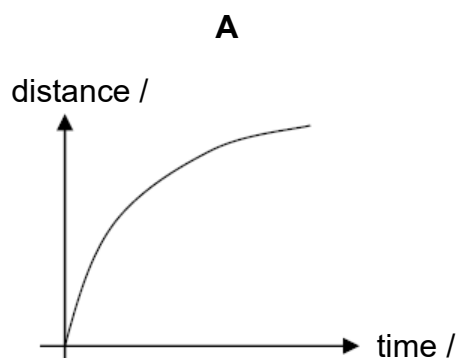


What is the period and frequency of one oscillation?

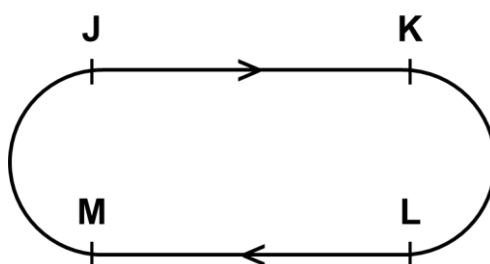
	period / s	frequency / Hz
A	0.25	0.25
B	0.25	4.0
C	4.0	0.25
D	4.0	4.0

- 6 A ball made of plasticine is thrown vertically upwards towards the ceiling. At the highest point of its path, it is stuck at the ceiling.

Which distance-time graph best describes the motion of the ball?

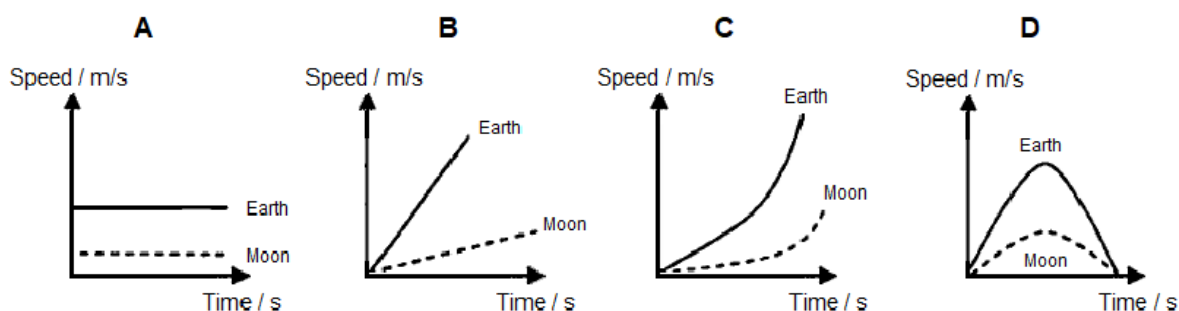


- 7 A car drives at a constant speed around the racing track **JKLM** as shown.



Which sections of the racing track will the car experience a resultant force?

- A JK and LM
 B JK and KL
 C KL and MJ
 D LM and MJ
- 8 A stone was dropped on Earth and later on the Moon. Given that the acceleration due to gravity on the Moon is $\frac{1}{6}$ that of the Earth's, which of the following speed-time graphs correctly represents their motion?

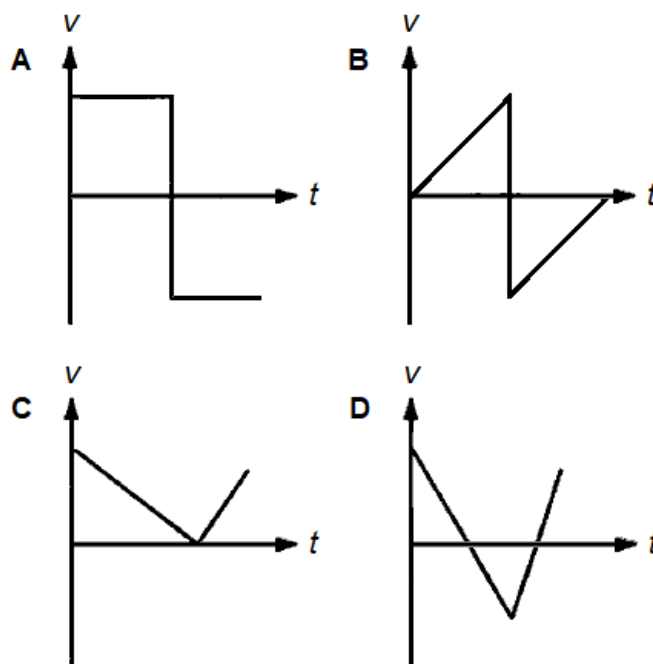


- 9 A lunar landing module is descending to the Moon's surface at a steady velocity of 10 m s^{-1} .
 At a height of 120 m, a small object falls from its landing gear.

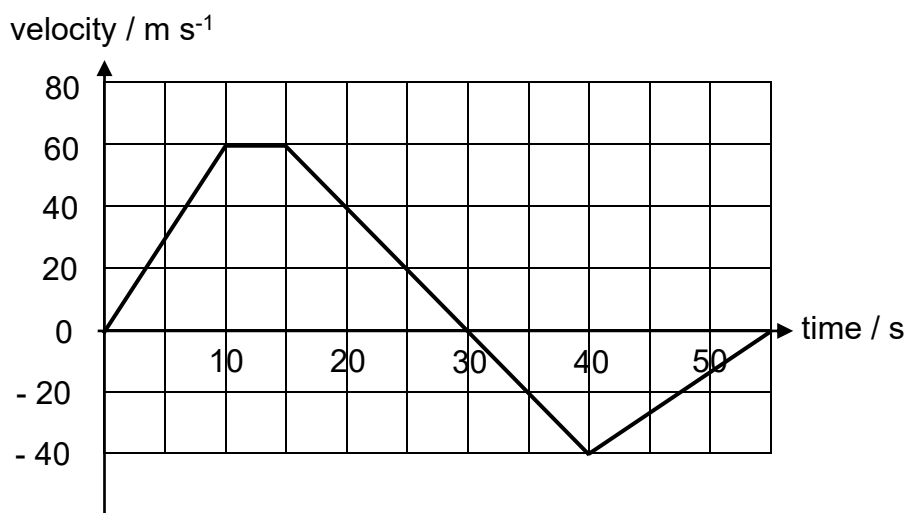
If the Moon's gravitational field strength is 1.6 N kg^{-1} , at what velocity does the object strike the surface of the Moon?

- A 10.0 m s^{-1} B 19.6 m s^{-1} C 22.0 m s^{-1} D 202 m s^{-1}
- 10 A body X of mass m is dropped from a height h . At the same time, another body Y of mass $3m$ is dropped from a height $3h$. Which statement is true?
 Neglect air resistance.
- A Y will eventually overtake and pass X.
 B As they fall, the distance between them remains a constant.
 C As they fall, the distance between them decreases.
 D Their average velocities during the fall are constant.

- 11 A small metal block slides along a horizontal frictionless surface, collides against a wall and rebounds along its original path. Which of the following v - t graphs would represent its motion?



- 12 The diagram shows a velocity-time graph of an object moving from rest along a straight line.



What is the displacement of the object at time = 40 s?

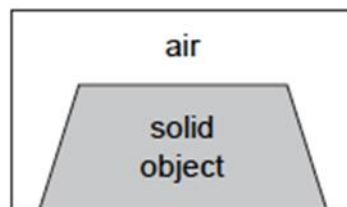
- A 550 m B 850 m C 1 050 m D 1 250 m

- 13** The following table shows the results of an experiment in which a solid material is placed in four different liquids.

liquid	density of liquid / kg m ⁻³	observation of solid material
mercury	13 600	floats
water	1 000	floats
turpentine	700	sinks
organic compound	550	sinks

What is the density of the solid material?

- A** exactly 700 kg m^{-3}
B exactly 1000 kg m^{-3}
C between 700 kg m^{-3} and $1\,000 \text{ kg m}^{-3}$
D between $1\,000 \text{ kg m}^{-3}$ and $13\,600 \text{ kg m}^{-3}$
- 14** A box has an internal volume of 1000 cm^3 . When a solid object is placed inside the box and the box is closed, the volume of air in the box becomes 520 cm^3 .



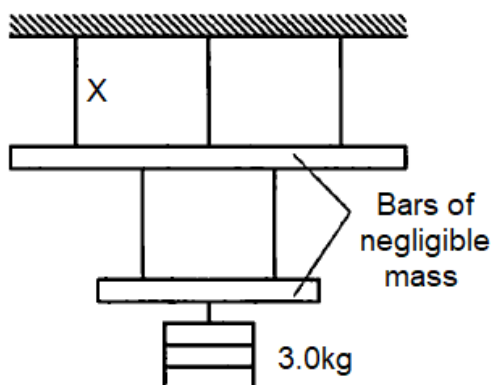
Given that the density of the object is 8.00 g/cm^3 , what is the mass of the object?

- A** 60.0 g
C 4160 g
- B** 3840 g
D 8000 g
- 15** A block of metal is taken from the Earth to the Moon. Which property of the metal block changes?
- A** density
C volume
- B** mass
D weight
- 16** A table with a table cloth has a vase on it. If the table cloth is pulled away quickly, the vase does not fall off the table or topple but remains where it is.

Which property of the vase makes this possible?

- A** density **B** energy **C** inertia **D** force

- 17 The diagram shows a mass of 3.0 kg suspended from 2 bars of negligible mass. They are connected by 5 light strings. What is the tension in the string labelled X?

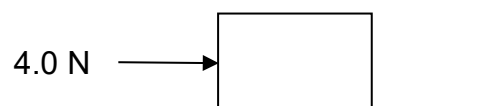


- A 1.0 N
B 5.0 N
C 10 N
D 15 N
- 18 A block is at rest on a table.



Which of the following pair of forces is an action and reaction pair?

- A gravitational force on Earth by block and normal reaction force by table on block
B gravitational force on Earth by block and weight of block
C normal reaction force by table on block and gravitational force on table by block
D normal reaction force on table by block and gravitational force of table on block
- 19 An object of mass of 2.0 kg is at rest on a rough horizontal surface which has a limiting friction of 1.0 N.

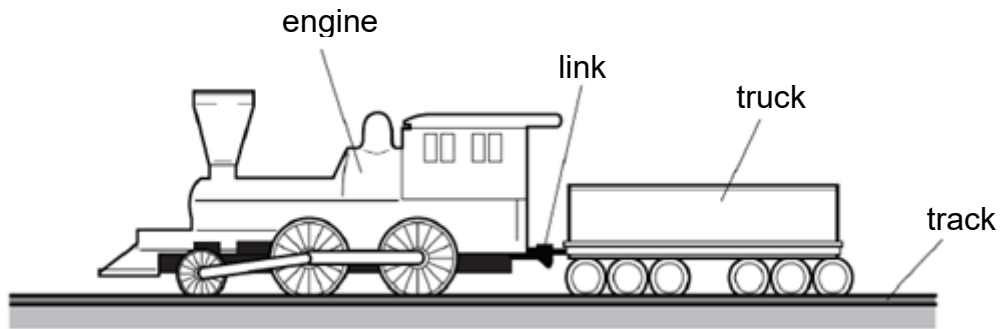


A constant force of 4.0 N is applied immediately to the object for 4.0 s and is then removed.

What is the speed of the mass at 6.0 s?

- A 0 ms⁻¹ B 4.0 ms⁻¹ C 5.0 ms⁻¹ D a. ms⁻¹₁

- 20** An engine pulls a truck at a constant speed on a level track.

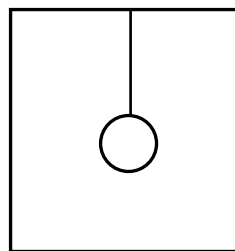


The link between the engine and the truck breaks. The driving force on the engine remains constant.

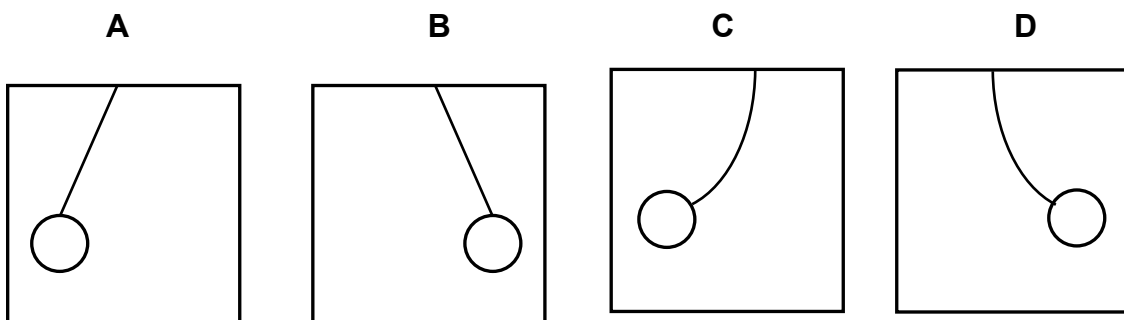
What effect does this have on the engine and on the truck?

	engine	truck
A	speed stays constant	slows down
B	speed stays constant	stops immediately
C	speeds up	slows down
D	speeds up	stops immediately

- 21** James hung a ball to the ceiling of his car using a thin thread. The figure below shows the ball when the car is at rest.



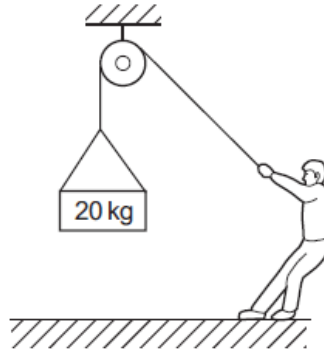
What is the position of the ball when his car accelerates uniformly to the left?



22 In which example does friction act in the same direction as the direction of a moving object?

- A** on a suitcase sliding down a slope
- B** on sandpaper rubbing a stationary wooden block
- C** on the skis of a skier accelerating downhill
- D** on the powered wheels of an accelerating car

23 A person just supports a mass of 20 kg suspended from a rope as shown below.



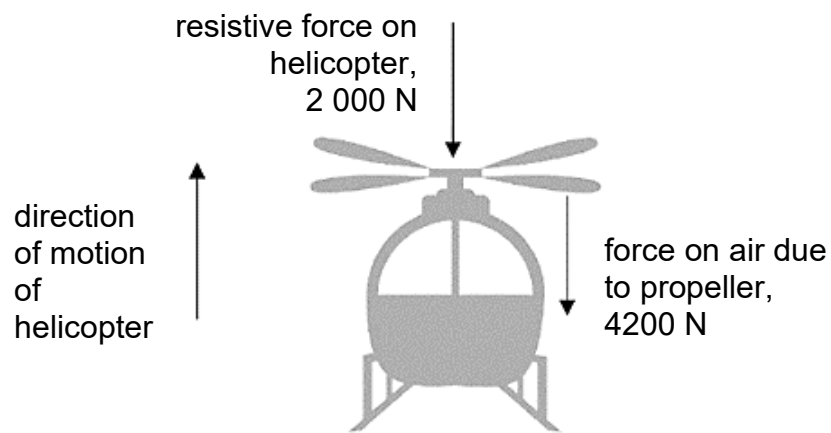
What is the resultant force acting on the mass?

- A** 0 N
- B** 10 N
- C** 20 N
- D** 200 N

24 A resultant force of 30 N acts on an object of mass M causing it to have an acceleration of a . What is the resultant force necessary to accelerate an object of mass $\frac{1}{2}M$ with an acceleration of $3a$?

- A** 15 N
- B** 30 N
- C** 45 N
- D** 60 N

- 25** A helicopter moves through the air and ascends against a total resistive force of 2 000 N. The propeller on the helicopter sweeps the air downwards with a force of 4 200 N.



What is the upward force on the propeller due to the air?

- A** 2000 N **B** 2200 N **C** 4200 N **D** 6200 N

Answers

1. C
2. D
3. A
4. B
5. C

6. A
7. C
8. B
9. C
10. B

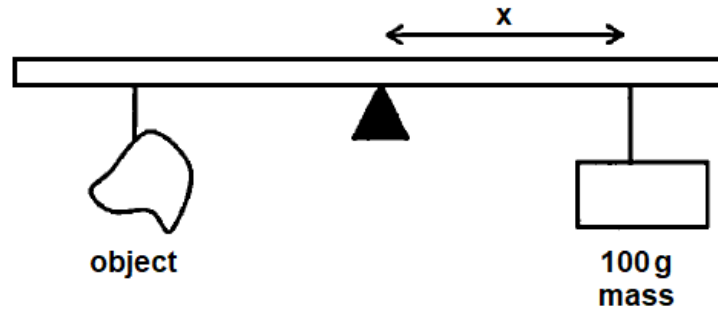
11. A
12. B
13. C
14. B
15. D

16. C
17. C
18. B
19. C
20. C

21. B
22. D
23. A
24. C
25. C

Turning effect of forces, Pressure, Work energy power

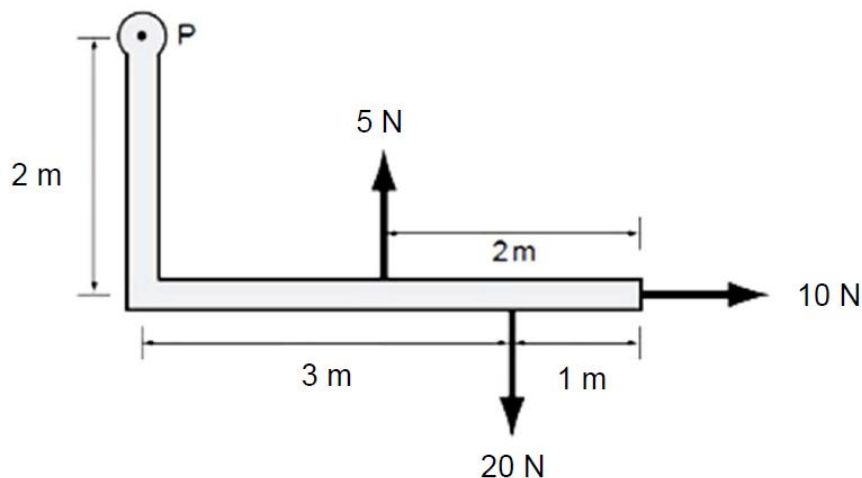
- 1 An object fixed at a point along a rod is balanced by a 100 g mass as shown.



The distance between the 100 g mass and the pivot is x . The setup is brought to the Moon where the gravitational field strength is 1.6 N/kg .

What should the distance between the 100 g mass and the pivot be in order to achieve balance again on the Moon?

- A** $1.6x / 10$
B x
C $1.6x$
D $10x / 1.6$
- 2 An L-shaped rigid lever arm is pivoted at point P.



Three forces act on the lever arm, as shown in the diagram.

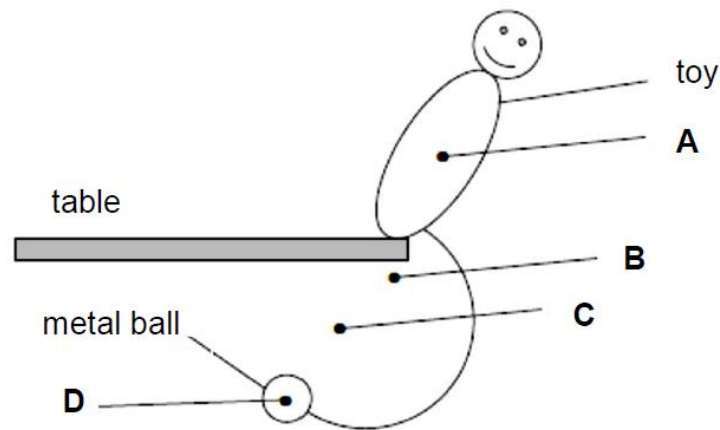
What is the magnitude of the resultant moment of these forces about point P?

- A** 30 Nm **B** 35 Nm **C** 50 Nm **D** 90 Nm

3 Which object when displaced is in neutral equilibrium?

- A A heavy weight suspended from a vertical string
- B A pencil balanced on its sharp tip
- C A pyramid resting on its base
- D A cone resting on its slant edge

4 The diagram shows a toy balanced on the edge of a table and at rest. The toy has a metal ball attached to it.



Where is the likely centre of gravity of the toy?

5 A garden table weighs 40 N and has a top surface area of 2.0 m². It is raining and the rain produces a pressure of 4.0 Pa on the table.

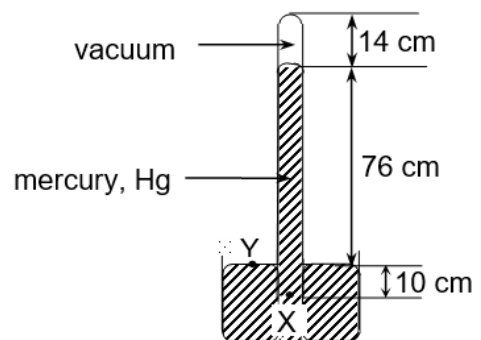
What is the force exerted by the table on the ground?

- | | | | |
|----------|------|----------|------|
| A | 20 N | B | 32 N |
| C | 42 N | D | 48 N |

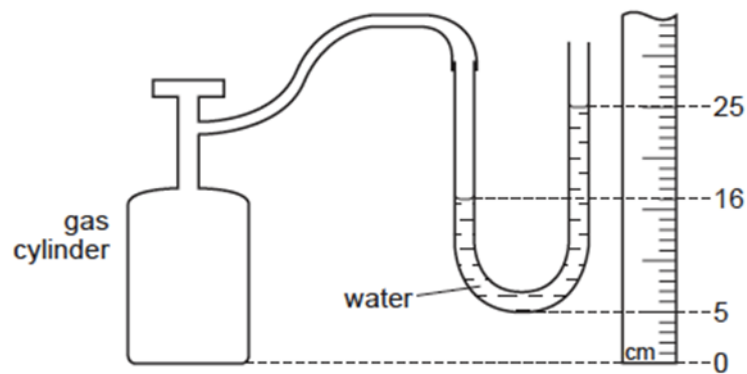
6 A mercury barometer is set up.

What are the pressures at points X and Y in cm Hg?

	point X	point Y
A	-10	0
B	76	86
C	86	76
D	105	95

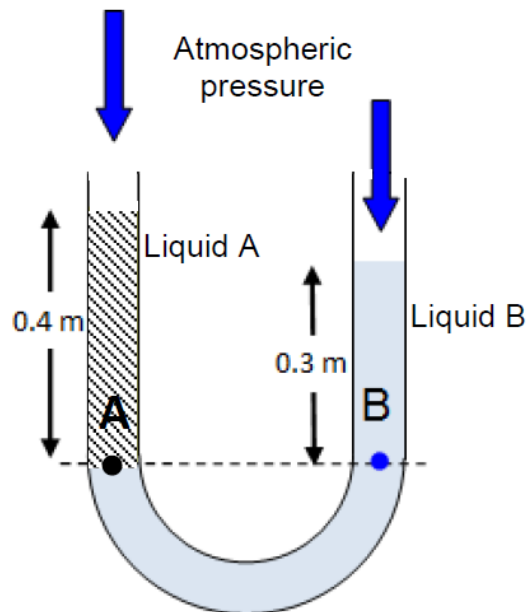


- 7 A manometer is attached to a gas cylinder as shown.



What is the pressure difference, in cm of water, shown by the manometer?

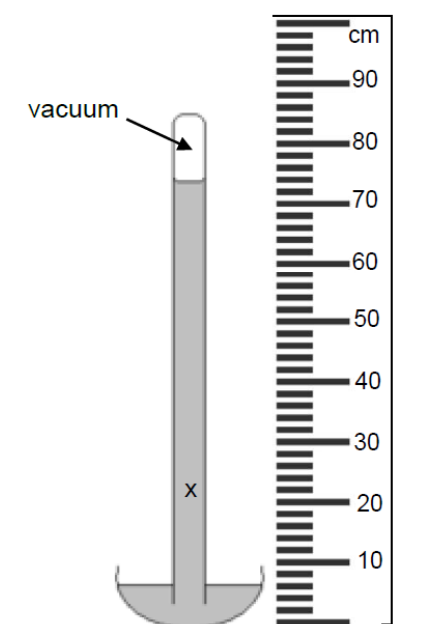
- A** 9.0 **B** 16.0 **C** 20.0 **D** 25.0
- 8 In the manometer below, 0.4 m of liquid A was added to the left arm, together with liquid B.



What is the density of liquid B if the density of liquid A is ρ ?

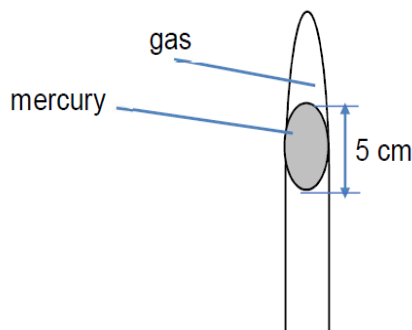
- A** $4\rho/3$ **B** $3\rho/4$ **C** $4\rho/7$ **D** $3\rho/7$

- 9 The diagram below shows a mercury barometer used to measure the surrounding atmospheric pressure.



What is the pressure measured at X?

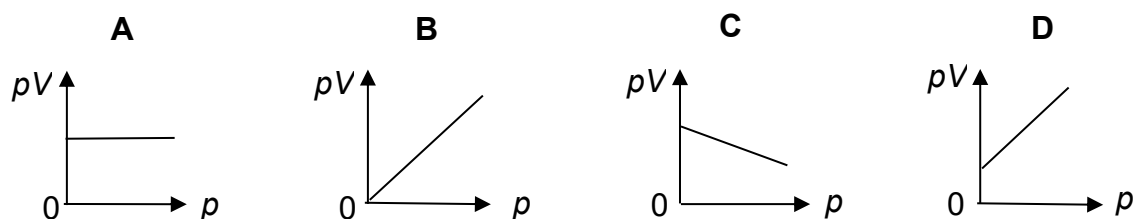
- A** 16 cm Hg **B** 22 cm Hg **C** 52 cm Hg **D** 62 cm Hg
- 10 The diagram shows a capillary tube with a 5.0 cm column of mercury.



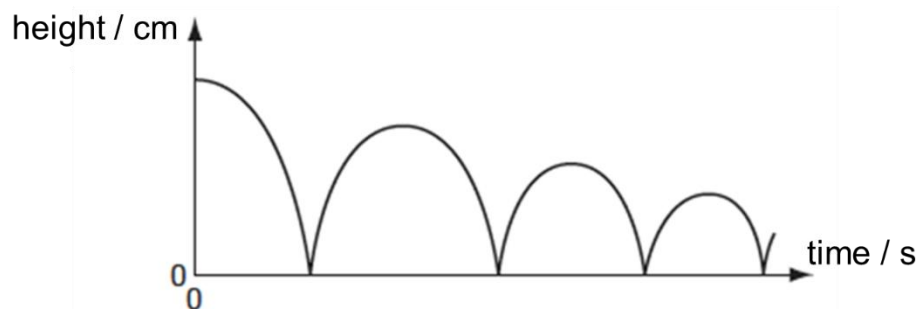
What is the pressure of the gas trapped?

The atmospheric pressure is 760 mm Hg and density of mercury is 13600 kg m^{-3} .

- A** 96.6 kPa **B** 103 kPa **C** 104 kPa **D** 110 kPa
- 11 Which of the following graphs represents the characteristic of a gas at constant temperature? (p = pressure, V = volume)



- 12 The graph shows how the height of a bouncing ball changes with time.



Which statement explains why the height of each peak decreases with time?

- A Kinetic energy is converted to potential energy at each bounce.
 - B Kinetic energy is converted to thermal energy at each bounce.
 - C The ball gains energy on impact with the floor.
 - D The ball is wearing out.
- 13 Initially, four identical uniform blocks, each of mass m and thickness h , are spread out on a table (diagram A).



Diagram A

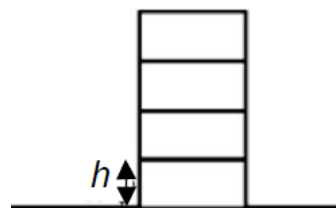


Diagram B

How much work is done on the blocks in stacking them up one on top of another as shown in diagram B?

Assume there is no frictional force.

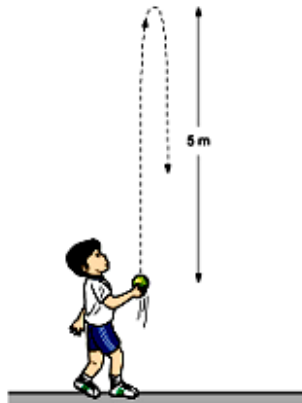
- A 4 mgh
 - B 6 mgh
 - C 8 mgh
 - D 12 mgh
- 14 A man drives a car and accelerates up a hill.
As the car moves up the hill, how does its gravitational potential energy and kinetic energy change?

	gravitational potential energy	kinetic energy
A	decreases	decreases
B	decreases	increases
C	increases	increases
D	increases	decreases

- 15** A stone of mass 0.40 kg is projected horizontally at a speed of 6.0 m s^{-1} from the top of a building 5.0 m high. The stone hits the ground with a speed of 10 m s^{-1} .

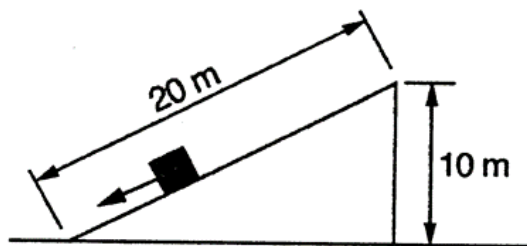
What is the amount of energy lost by the stone as it falls through the air?

- A** 0 J **B** 2.4 J **C** 7.2 J **D** 14 J
- 16** A student throws a 500 g ball upwards with an initial velocity of 20 m s^{-1} . Assume there is no air resistance.



What is the gain in potential energy of the ball after leaving his hand for 1.0 s ?

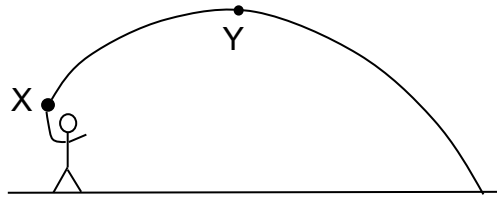
- A** 100 J **B** 75 J **C** 25 J **D** 10
- 17** A wooden block slides from rest through a distance of 20 m down a frictionless slope as shown.



What is the speed of the block at the bottom of the slope?

- A** 1.4 m s^{-1} **B** 10 m s^{-1}
C 14 m s^{-1} **D** 100 m s^{-1}

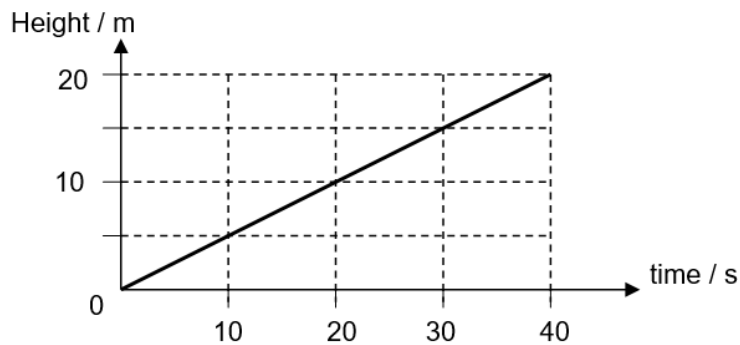
- 18 A student threw a 0.20 kg ball with 2.5 J of energy and the path of the ball is shown. Neglect air resistance.



What is the speed of the ball at X and the total energy at Y?

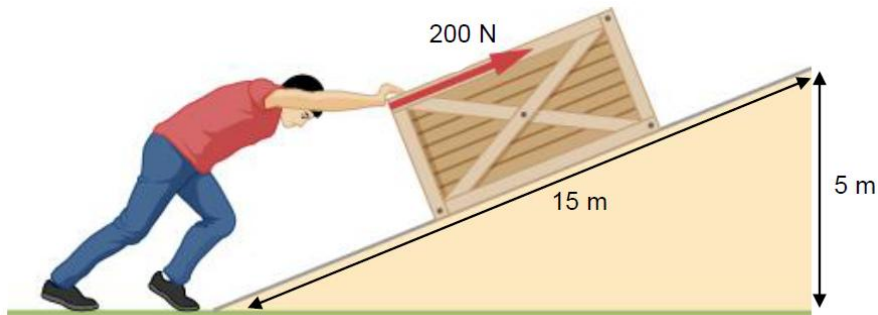
	speed at X	total energy at Y
A	5.0 m s ⁻¹	2.5 J
B	5.0 m s ⁻¹	25 J
C	25 m s ⁻¹	2.5 J
D	25 m s ⁻¹	25 J

- 19 The graph shows how the vertical height through which a winch raises a mass of 10 kg varies with time.



What is the power output of the winch?

- A 5.0 W B 20 W C 50 W D 200 W
- 20 A man is pushing a crate of mass 50 kg with a constant force of 200 N to the top of a smooth ramp at a constant speed (diagram not drawn to scale).



What is his efficiency?

- A 83 % B 13 % C 25 % D 8.3 %

Answers

1. B
2. A
3. D
4. B
5. D

6. C
7. A
8. A
9. C
10. A

11. A
12. B
13. B
14. C
15. C

16. B
17. C
18. A
19. C
20. A