

Forces and their effects/the solar system and beyond

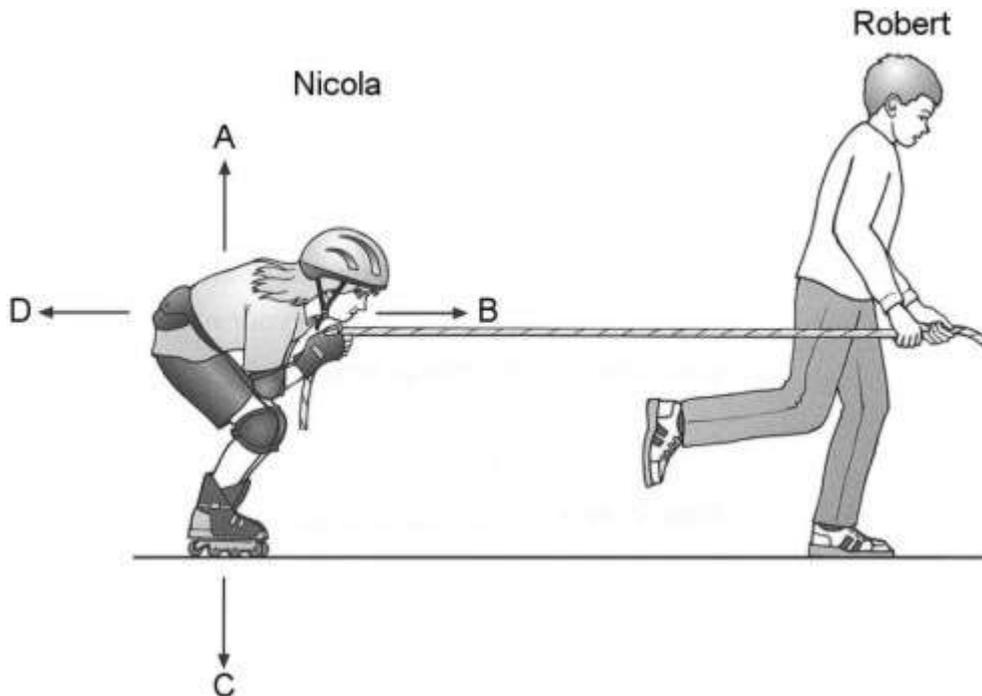
7K & 7L

21 min

22 marks

Q1-L3, Q2-L4, Q3-L4, Q4-L5, Q5-L5, Q6-L6

1. (a) Nicola is trying out her new roller blades. Robert is pulling her along with a rope. Arrows A, B, C and D show the directions of four forces acting on Nicola.



- (i) Which arrow shows the direction of the force of **gravity** on Nicola?
Give the letter.

.....

1 mark

(ii) Which arrow shows the direction of the force of the **rope** on Nicola?
Give the letter.

.....

1 mark

(b) Robert pulls Nicola at a steady speed of 2 metres per second. How far will Nicola travel in 10 seconds?

..... metres

1 mark

(c) Nicola lets go of the rope and she slows down. Gravity still acts on Nicola.

Give the name of **one** other force still acting on Nicola after she lets go of the rope.

.....

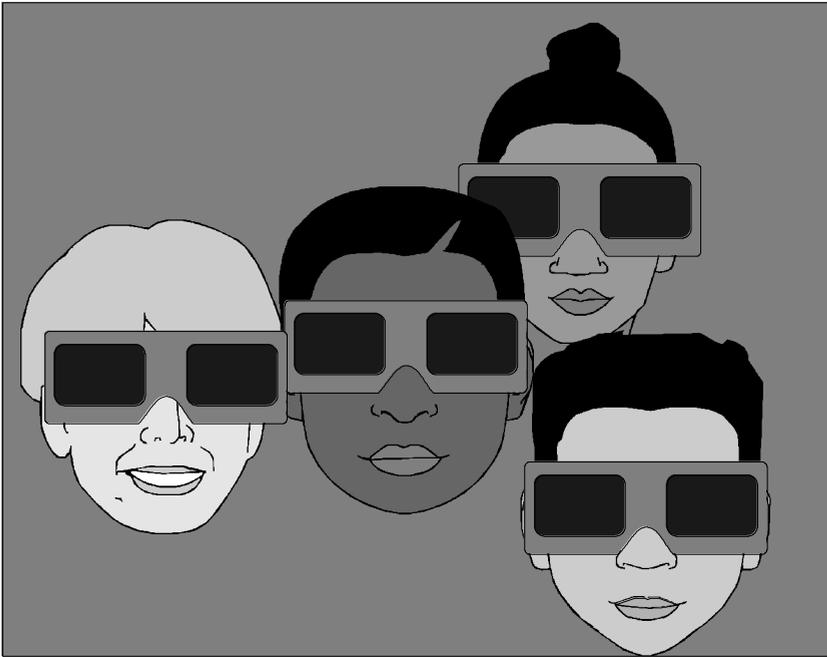
1 mark

maximum 4 marks

2. Some children watched an eclipse of the Sun.

During the eclipse, the Moon passed between the Sun and the Earth.

It blocked out sunlight.



(a) Amrik watched the eclipse. He knew that the Sun is much bigger than the Moon but they looked about the same size.

Why did they look the same size? Tick the correct box.

The Moon is nearer to the Earth than the Sun is.

The Sun is nearer to the Earth than the Moon is.

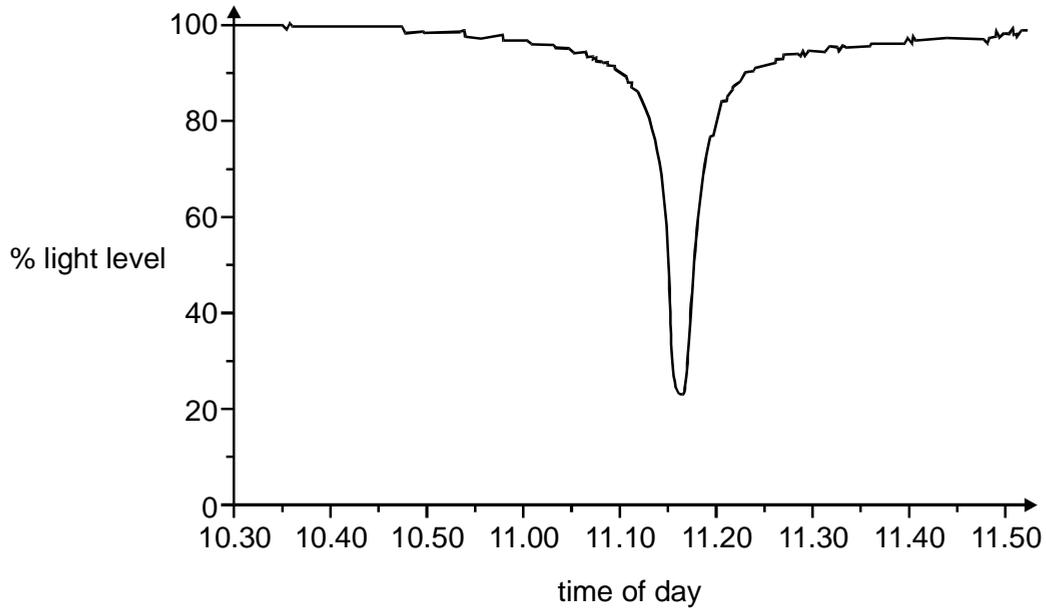
The Sun goes round the Earth faster than the Moon does.

The Moon goes round the Sun faster than the Earth does.

1 mark

(b) Amrik's class measured the light level during the eclipse.

The graph below shows their results.



(i) At what time did the Moon block out most of the Sun's light?
Use the graph to help you.

..... am

1 mark

(ii) What happened to the air temperature during the eclipse?

.....

Give the reason for your answer.

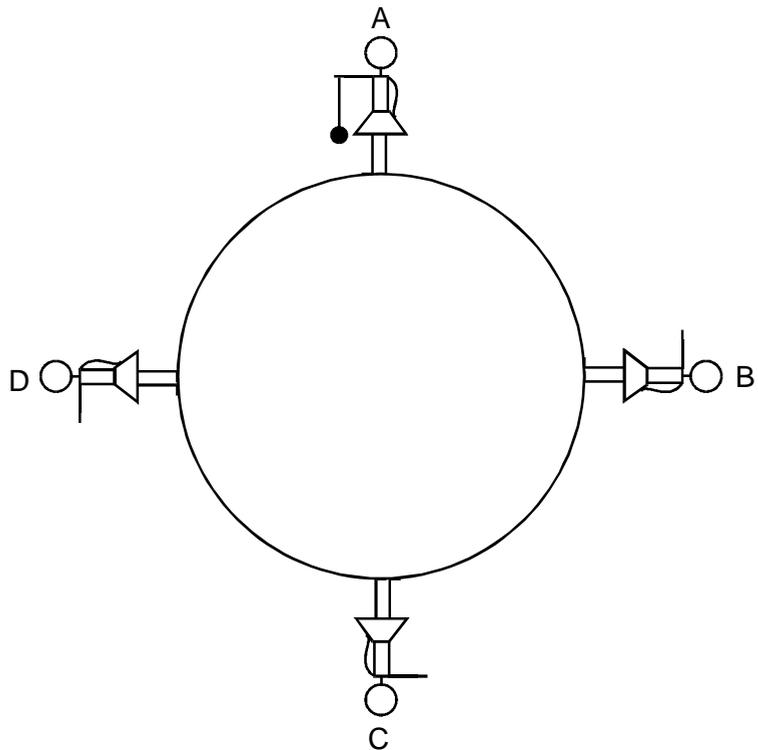
.....

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1 mark

Maximum 3 marks

3. Lisa drew a picture of herself standing at four different positions on the Earth,



not to scale

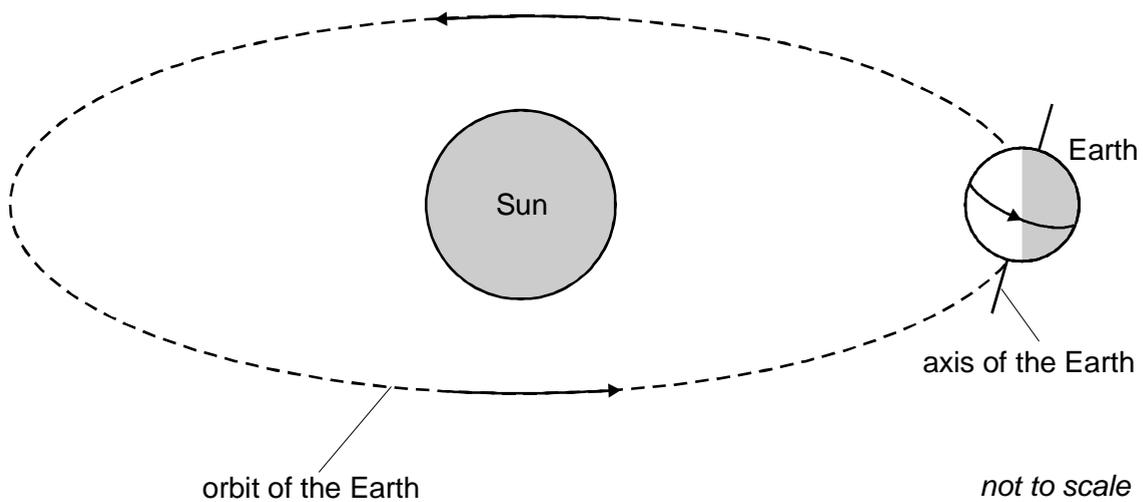
- (a) (i) Draw an arrow at **each** of the four positions to show the direction of the force of gravity on Lisa.
- (ii) The drawing at position A shows Lisa holding a ball on a string. Draw the ball and string in positions B, C and D.

1 mark

1 mark

(b) The drawing below shows:

- that the Earth goes round the Sun;
- that the Earth rotates on its axis.



not to scale

Choose from the list below to answer parts (i) and (ii).

60 seconds 60 minutes 24 hours 7 days 28 days 365 days

(i) How long does it take for the Earth to go round the Sun once?

.....

1 mark

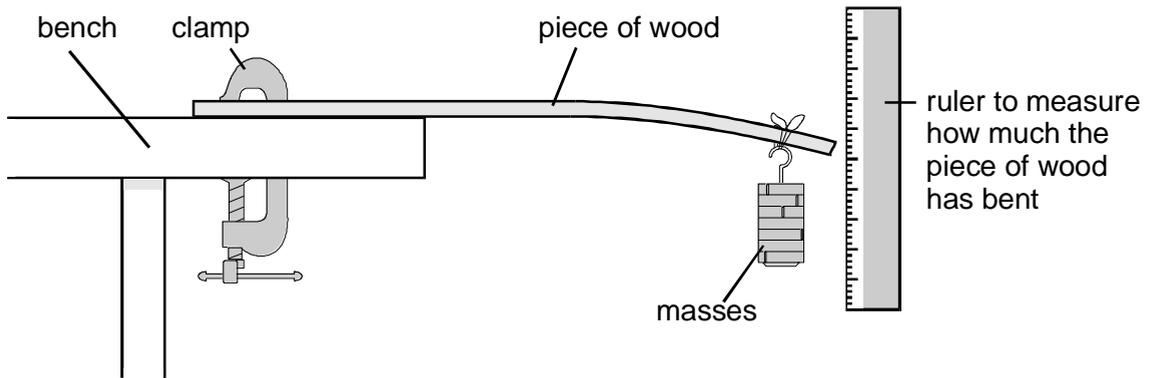
(ii) How long does it take for the Earth to rotate on its axis once?

.....

1 mark

Maximum 4 marks

4. Ruth is investigating how much a piece of wood can bend. She hangs some masses on the end of the piece of wood and measures how far the wood has bent.

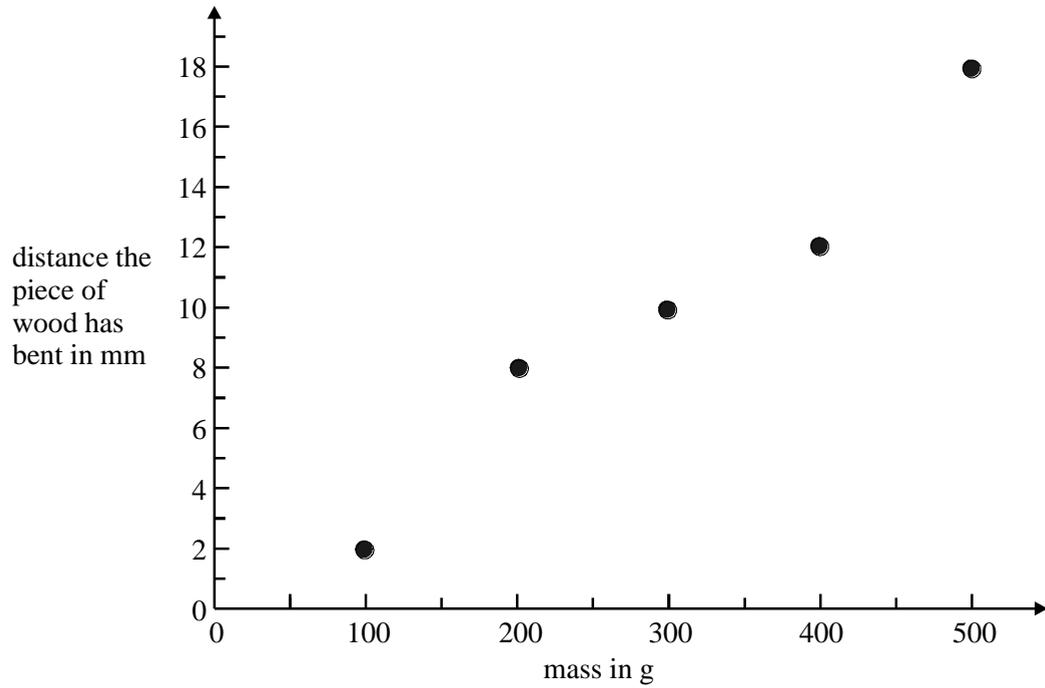


(a) Give the name of the force which pulls the masses downwards.

.....

1 mark

(b) The graph below shows Ruth's results.



(i) Complete the graph by drawing a straight line of best fit.

1 mark

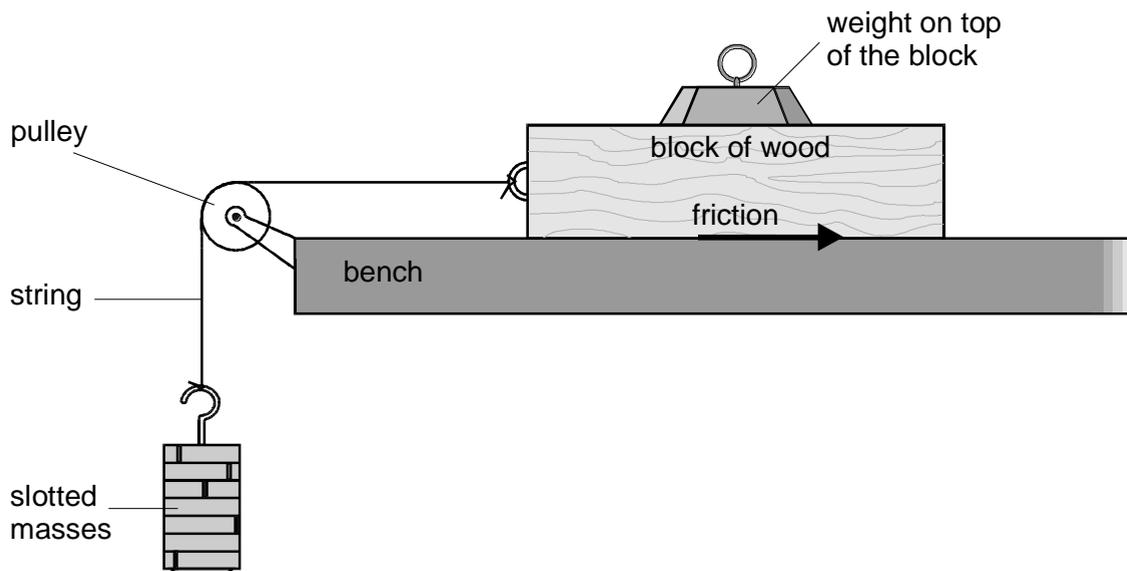
(ii) A mass of 350 g is hung on the piece of wood. How much does the wood bend?

..... mm

1 mark

Maximum 3 marks

5. Nazia is investigating how easily a block of wood slides along a wooden bench. The diagram shows her experiment.



(a) Nazia does the experiment with different weights on top of the block. She counts

how many slotted masses she needs to hang from the string to make the block of wood slide. Her results are shown in the table.

weight on top of the block in N	number of slotted masses needed
0	5
1	7
2	9
3	1
4	13

- (i) Describe how the number of slotted masses needed to move the block varies with the weight on top of the block.

.....

1 mark

- (ii) Nazia does the experiment with a weight of 3.5 N on top of the block of wood.

How many slotted masses would she need to make the block slide?

.....

1 mark

- (b) Nazia does her experiment again. This time she slides the block of wood over a sheet of glass instead of the bench top.

- (i) Suggest how her results would be different this time.

.....

1 mark

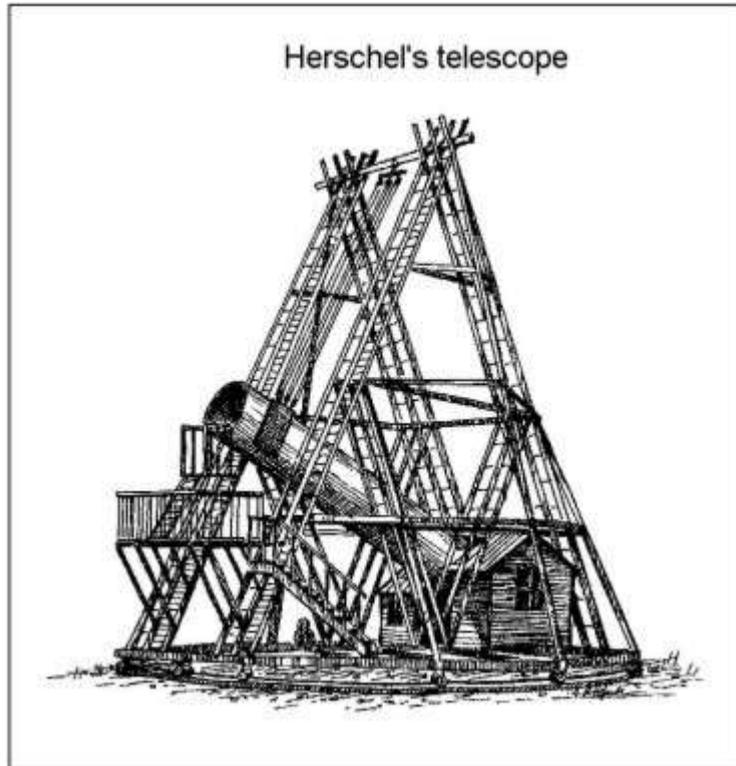
- (ii) Using the same sheet of glass and block of wood, and keeping the same weight on top, suggest **one** way Nazia could reduce the force of friction.

.....

1 mark

Maximum 4 marks

6. Until 1781 scientists thought there were only six planets in the solar system. Then a scientist called Herschel looked through a very large telescope that could turn to follow objects in space. He watched a bright object in the night sky for a few months and made drawings of what he saw. He concluded it was a planet.



- (a) What method did Herschel use to discover the new planet?
Tick the correct box.

He carried out practical tests in the laboratory.

He asked scientists' opinions.

He observed the environment.

He gathered data from books.

1 mark

- (b) Scientists today use satellites as well as telescopes to observe the universe.

Suggest **one** way that developments in equipment have changed the information scientists collect about planets.

.....
.....

1 mark

- (c) Before 1781, scientists believed there were 6 planets in our solar system. Now scientists believe there are 10 planets.

What do these ideas suggest about our knowledge of our solar system?

.....
.....

1 mark

- (d) What causes scientists to reject an idea and replace it with a new one?

.....
.....

1 mark

maximum 4 marks