

JOHN GRAY HIGH SCHOOL

KS3 SCIENCE: YEAR 9

MOTION ON EARTH & IN SPACE

PAPER 2

Time : 45 mins

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of **THREE** questions.
2. Answer **ALL** questions.
3. Attempt your answers in the spaces provided in workbook.
4. Remember to read the questions properly before attempting to answer.
5. You are permitted to use a calculator in this exam.

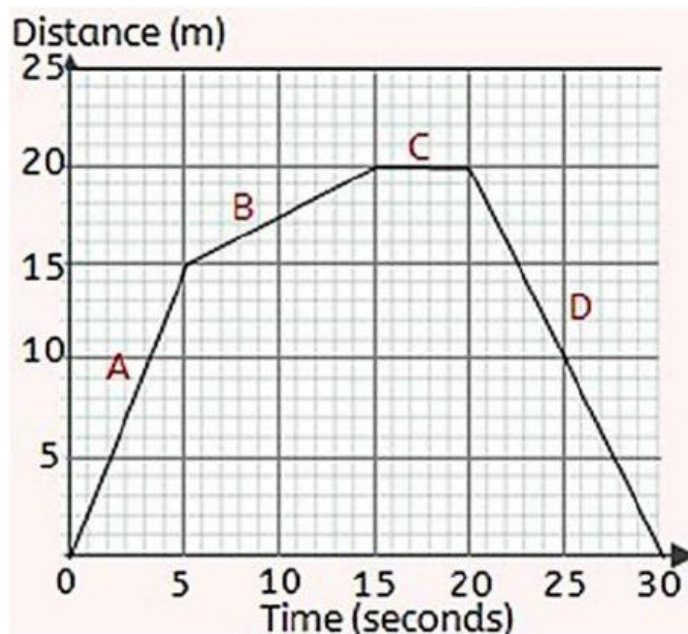
ENSURE PROPER SPELLING FOR BEST RESULTS (WORD BANKS ARE PROVIDED)

Name: _____

Teacher's Name: _____

DO NOT MOVE ON FROM THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

1. a. The distance time graph below shows Walter riding his bicycle to and from Grandma's house to quickly put a letter the mailbox. Answer the following questions using the graph.

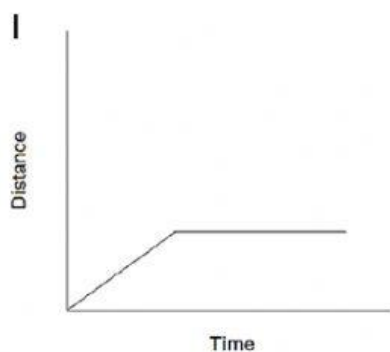


Type the letter which represents where Walter was:

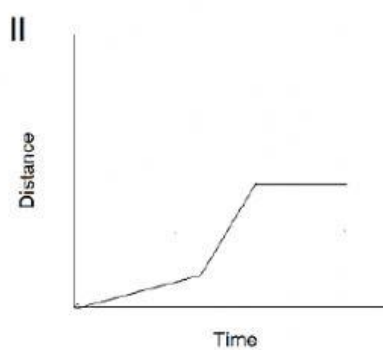
- i. Riding fastest to Grandma _____ ii. Going back home _____
- iii. At the mailbox _____
- iv. How long did Walter take to drop the letter in the mailbox? _____ seconds
- v. How far does Grandma live from Walter? _____ meters
- vi. How long did it take him to get to Grandma's? _____ seconds
- vii. How long did it take him to return from Grandma's house? _____ seconds
- viii. Calculate Walter's speed, travelling Region A TO Grandma's house. _____ m/s
- ix. Calculate Walter's speed travelling FROM Grandma's house? _____ m/s

(9 marks)

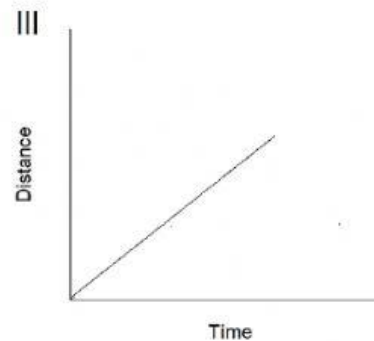
b. Choose the best description for each of the graphs below.



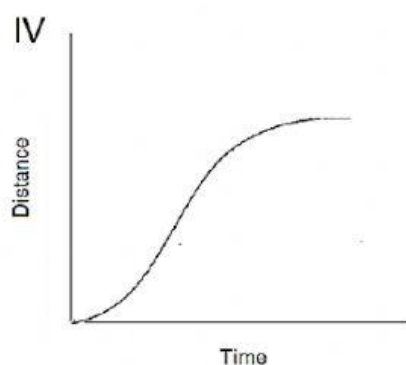
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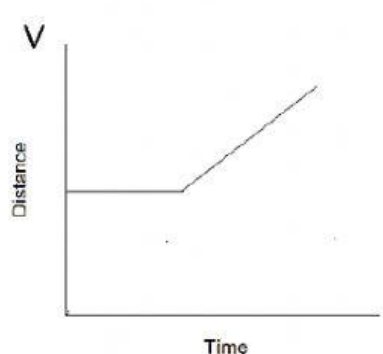
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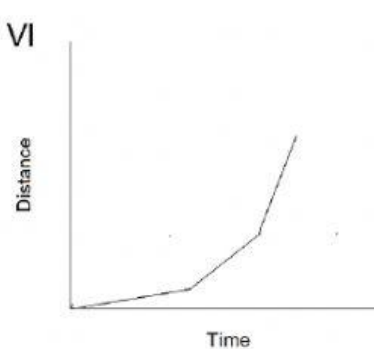
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Description: _____



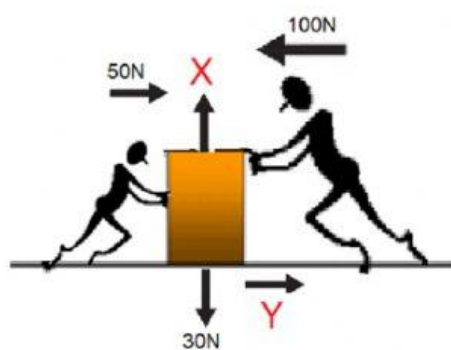
Description: _____



Description: _____

(6 marks)

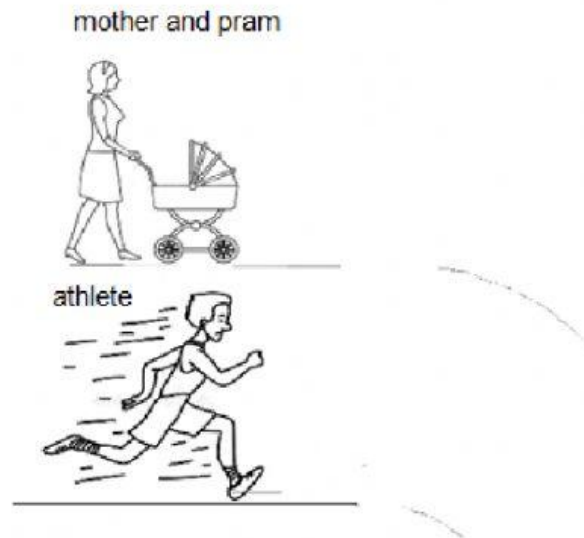
2. a. Use the picture to answer the following questions.



- If all forces are balanced, what is the value of force X? _____ N
- If all forces are balanced, what is the value of force Y? _____ N
- What is the weight of the box? _____ N
- The force Y is called _____.

(4 marks)

- b. An athlete is running at a speed of 10km/h and passes a mother pushing a pram at a speed of 2 km/h . They are both travelling in the same direction.

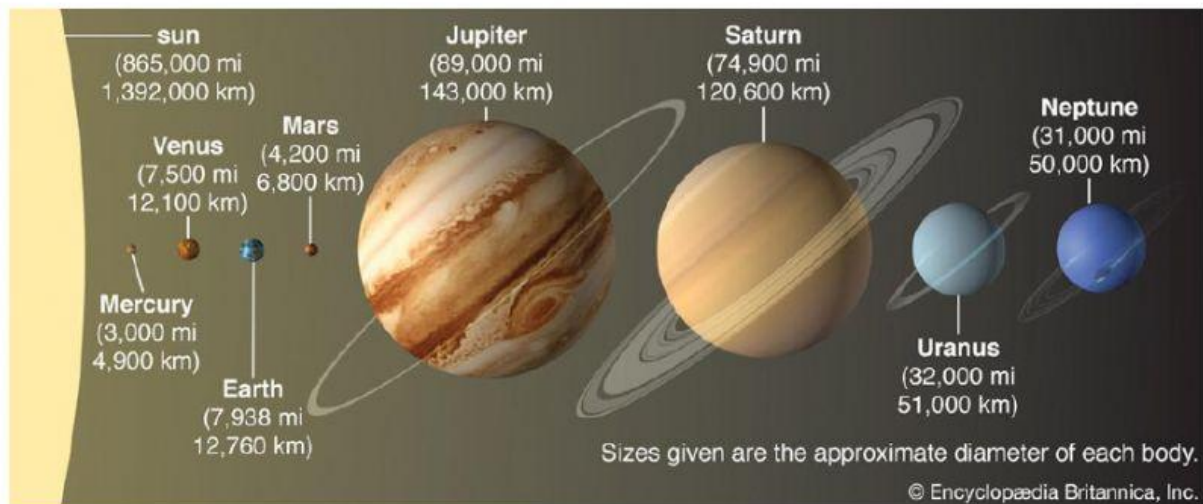


- i. What is the relative speed of the athlete and the mother pushing the pram? _____ km/h
- ii. How far will the athlete reach in half an hour? _____ km
- iii. How far will the mother pushing the pram reach in half an hour? _____ km
- iv. How far will the athlete reach in 6 hours? _____ km
- v. The athlete is travelling at a constant speed of 10km/h as he runs past the mother and arrives at a coffee shop 10km away. After the athlete arrives at the coffee shop, if the mother continues pushing the pram at a constant speed of 2km/h , how long will it take her to reach the same coffee shop?
_____ hours
- vi. To the runner, how would the mother pushing the pram appear to be moving as he passes her?

The mother pushing the pram would appear to be moving _____.

(6 marks)

3. a. Use the diagram below to answer the following questions about our galaxy.



- i. Which planet is the largest? _____
- ii. Which planet is 31,000 miles wide? _____
- iii. Which planet is the furthest from the Sun? _____
- iv. How many miles wide is Saturn? _____
- v. Which planet is 5th from the Sun? _____
- vi. Which planet would feel the hottest? _____
- vii. Which planet 51,000 kilometers wide? _____
- viii. Which planet would probably have the least water? _____
- ix. A man with a mass of 200kg travels to Jupiter where the gravitational acceleration is 26 m/s^2 . Calculate the man's weight on Jupiter using the equation:

$$\text{Weight} = \text{Mass} \times \text{Gravitational acceleration}$$

Answer: The man's weight on Jupiter is _____ Newtons (N)

(5 marks)

b. Draw a line to connect phrases from Column A to the correct phrases in Column B to make complete, true sentences.

	Column A
i	An object's weight is caused because the object.....
ii	The direction "down".....
iii	Gravity is less on the Moon than on Earth because.....
iv	Gravity gets less if.....
v	The planets all move in.....
vi	To calculate the speed of a car,

Column B
the Moon has less mass than the Earth.
elliptical orbits around the Sun.
is pulled towards Earth by Earth's gravitational force.
divide distance travelled by the time.
two objects get further apart.
is towards the center of the Earth.

(3 marks)

c. Draw a line to connect phrases from Column A to the correct phrases in Column B to make complete, true sentences.

	Column A
i	Balanced forces.....
ii	The air resistance on a car can be increased by.....
iii	If a car is travelling at 50mph.....
iv	The force of gravity.....
v	A toy's mass is 5kg. The acceleration due to gravity on Mars is 4m/s^2 so the toy on Mars.....
vi	A bus travelled a distance of 20km in 2 hours.....

Column B
so its speed is 10km/h.
it will take 2 hours to travel 100 miles.
do not change the speed of moving objects.
would weigh 20N.
is a non-contact force since it does not need to touch the object to act on it.
making the car higher and bigger.

(3 marks)

d. Drag the words from the word bank to the lines below to complete the sentences correctly.

Attraction	Gravity	Orbit	Outer
Planets	Solar	Strong	Sun

The _____ has a much larger mass than the Earth, and it's _____ is very _____. The force of the Sun's gravity keeps the _____ moving in an elliptical _____ around it. If there is no gravity from the Sun, they would just fly off into _____ space. There is a force of _____ between the Sun and all the planets in our _____ System. **(4 marks)**

TOTAL = 40 marks