

# REASONING

## 9ER16

First name \_\_\_\_\_

Last name \_\_\_\_\_

School \_\_\_\_\_

Class \_\_\_\_\_

Date of birth ○○ ○○ ○○○○

Date of test ○○ ○○ 2016

Total score  (maximum 20)



139146



Llywodraeth Cymru  
Welsh Government

- 1 The spacecraft Juno has **three** rectangular solar panels.

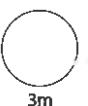


Each of the three solar panels is 2.7m wide and 8.9m long.

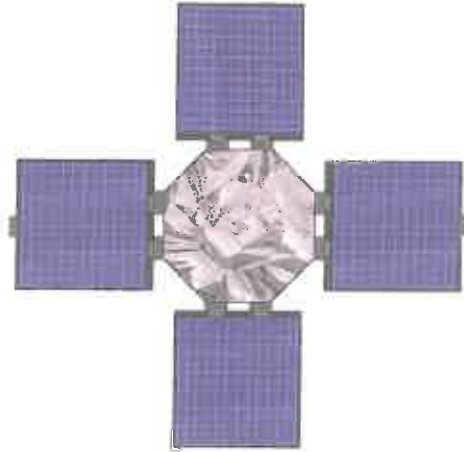
At Jupiter, a **square metre** of solar panel will give 6.2 watts.



Show that when the spacecraft reaches Jupiter the three solar panels will together give about 450 watts of power.

A large, empty rectangular box with a red border, intended for the student to write their solution. In the top-left corner of the box, there is a small icon of a notepad with a pencil resting on it.

Imagine a spacecraft with **four identical square** solar panels that could travel to the planet Saturn.



At Saturn, a **square metre** of solar panel would give only **1.8** watts.

For the spacecraft to give a total of **450** watts, what should the length of one side of a square solar panel be?

A large rectangular area outlined in red, intended for the student to write their answer. In the top-left corner of this area, there is a small icon of a notepad and a pencil. In the bottom-right corner of this area, there is a smaller red-bordered box containing the letter 'm', indicating the unit for the answer.

2

At **3pm** two robots stand at opposite ends of a straight line, 1km apart.



Robot A



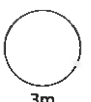
Robot B

The robots move towards each other at different speeds and meet at **7pm**.

Robot A moves at a constant speed of **0.15** kilometres per hour.

What constant speed does robot B move at?

kilometres per hour



3m

3 Is £50 reduced by 10%, then increased by 10%, equal to £50?

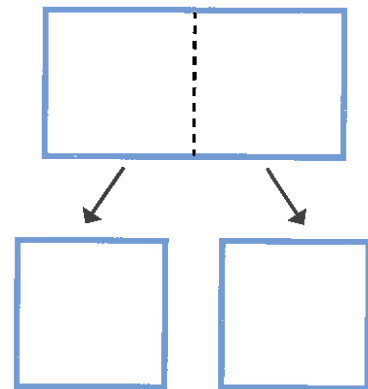
Show how you know.



2m

4 The **perimeter** of a rectangle is 72cm.

The rectangle is cut in **half** to make **two squares**.



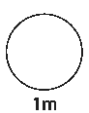
Work out the length of one side of the square.



2m

- 5 Write the two numbers that
- **multiply** together to make  $-10$  and
  - **add** together to make  $3$

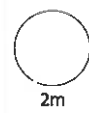
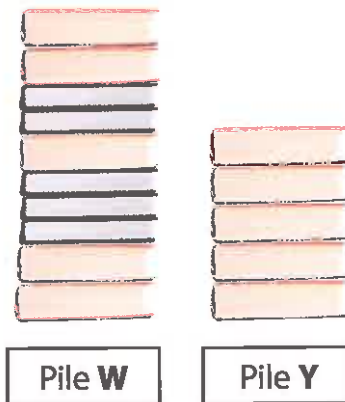
and



- 6 The photograph shows identical red books and identical black books.  
All pages have the same thickness.

Which pile has the greater **mean** number of pages per book?

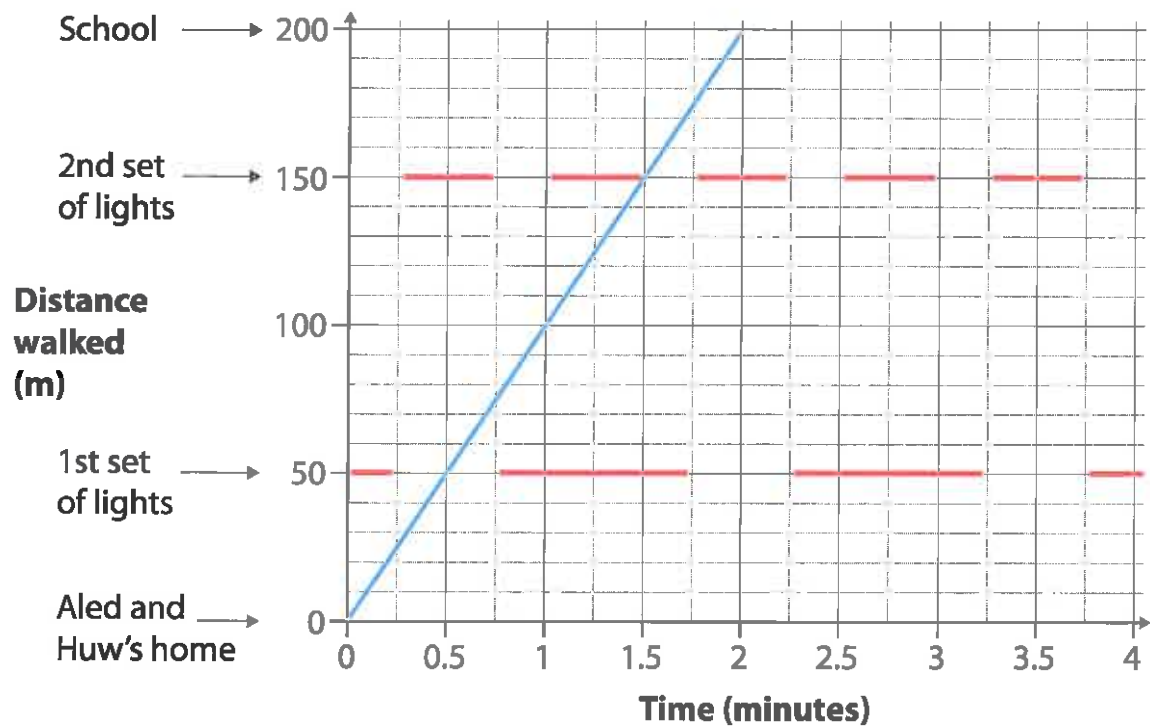
Explain how you know.



7 The blue line on the graph shows Aled's journey from home to school one day.

The red lines — show when the crossing lights were red.

Aled did not need to stop at either set of lights.

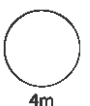


Huw walked at the **same speed** as Aled, and left home **1 minute** after him.

Show Huw's route accurately on the graph, and remember, he must **not** walk when the lights are red.

How many minutes **after Aled** did Huw arrive at school?

minutes after Aled



The images in question 1 are courtesy of NASA/JPL-Caltech.

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