

Do NOT open this paper until instructed to do so.
While you are waiting to start, write your name in the box directly below.

Name _____

Set _____



Shrewsbury School

**Michaelmas Progress Test
Year 10 : 4th Form**

**Paper 3
Non-Calculator
Thursday 24th November 2022**

40 minutes

There are **30** marks available in this paper.
You must show **full working** where appropriate in order to gain full marks.

Question 1

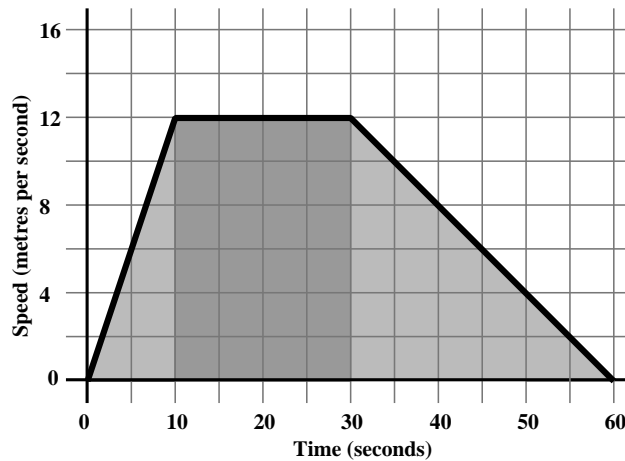
A car is waiting at a red traffic light.

It turns green, and the car accelerates at a constant rate for 10 seconds.

The car then travels at constant speed of 12 m/s for twenty seconds.

Finally, with another red light ahead, the car decelerates and stops.

Here is a speed-time graph for the car as it moves between the two red lights.



- (i) Find the distance travelled during the 10 seconds of acceleration.

[1 mark]

- (ii) Find the distance travelled when moving at constant speed.

[1 mark]

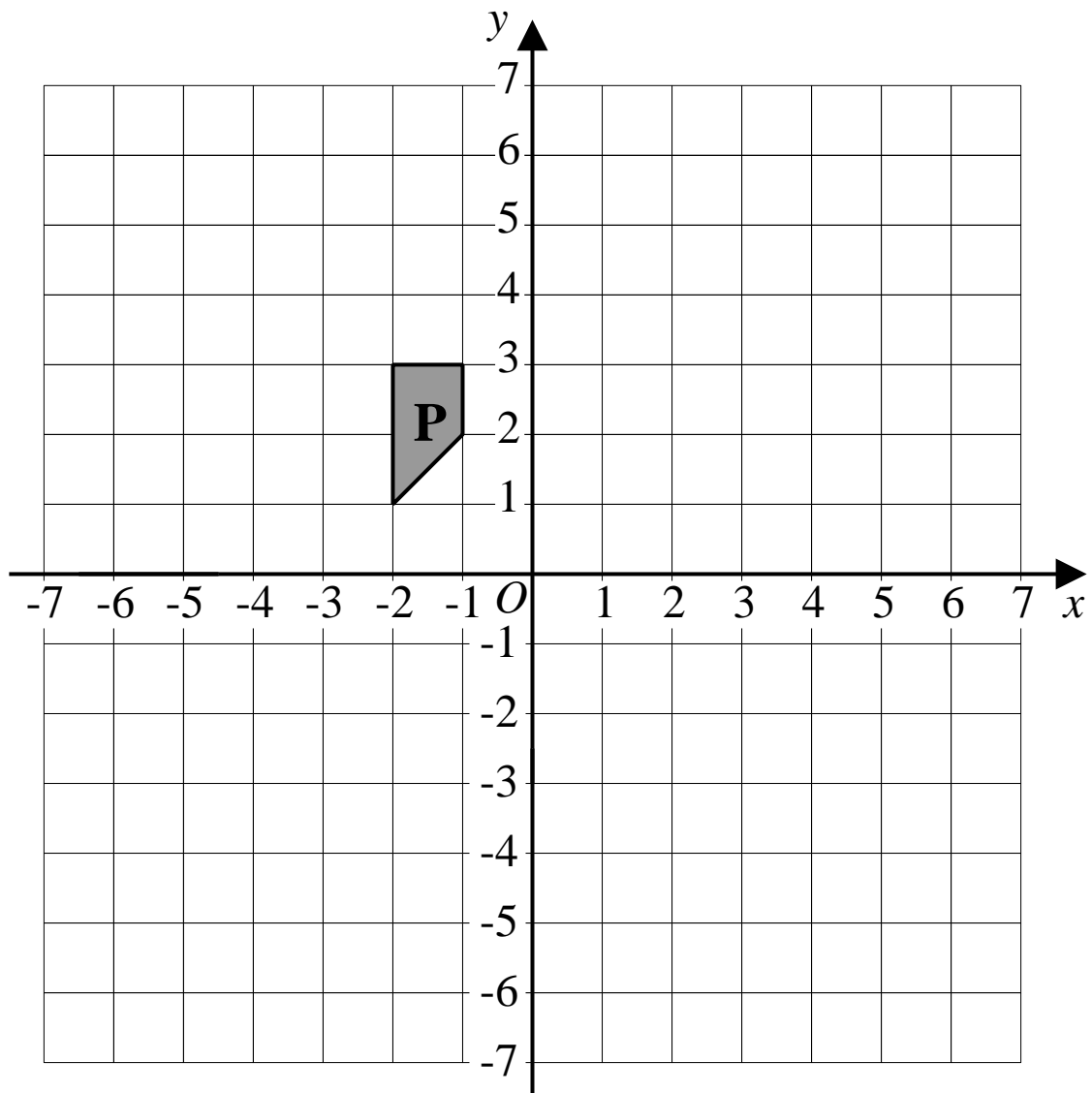
- (iii) Given that the car travelled 180 metres in the last 30 seconds, what is the total distance travelled between the two red lights ?

[1 mark]

- (iv) Find the average speed that the car travelled between the red lights.

[2 marks]

Question 2



- (i) Translate shape **P** by the vector $\begin{pmatrix} 5 \\ -4 \end{pmatrix}$

Label the new shape **Q**

[2 marks]

- (ii) Rotate shape **P** by 180° about $(-4, -1)$

Label the new shape **R**

[2 marks]

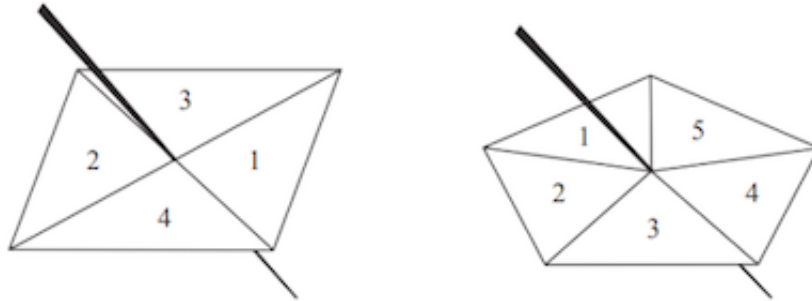
- (iii) Reflect shape **P** in the y -axis.

Label the new shape **S**

[1 mark]

Question 3

Here are a 4-sided spinner and a 5-sided spinner.
The spinners are fair.



Jeff is going to spin each spinner once.
Each spinner will land on a number.
Jeff will get his score by adding these two numbers together.

(a) Complete the possibility space diagram for each possible score.

		5-sided spinner				
		1	2	3	4	5
4-sided spinner	1	2	3	4	5	6
	2	3				
	3	4				
	4	5				

[1 mark]

Jeff spins each spinner once.

(b) Find the probability that Jeff gets,

(i) a score of 3

[1 mark]

(ii) a score of 5 or more

[1 mark]

Question 4

A man runs 6 km at a steady speed in 40 minutes.

(i) How many metres is 6 km ?

[1 mark]

(ii) How many seconds are in 40 minutes ?

[1 mark]

(iii) Find the man's speed in m/s

[1 mark]

Question 5

Three positive whole numbers are all different.
The numbers have a median of 8 and a mean of 6

Find the three numbers.

[2 marks]

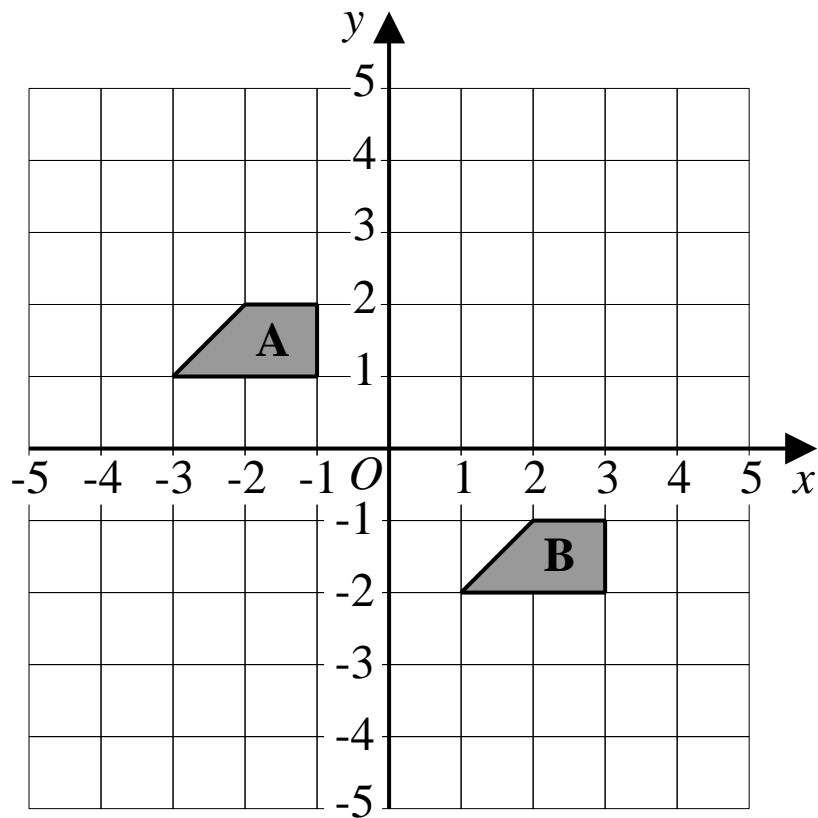
Question 6

A bag contains red discs, black discs and white discs.
The number of black discs is equal to the number of white discs.
Selina is going to take a disc at random from the bag.
The probability that she will take a red disc is 0.6

Work out the probability that she will take a black disc.

[2 marks]

Question 7



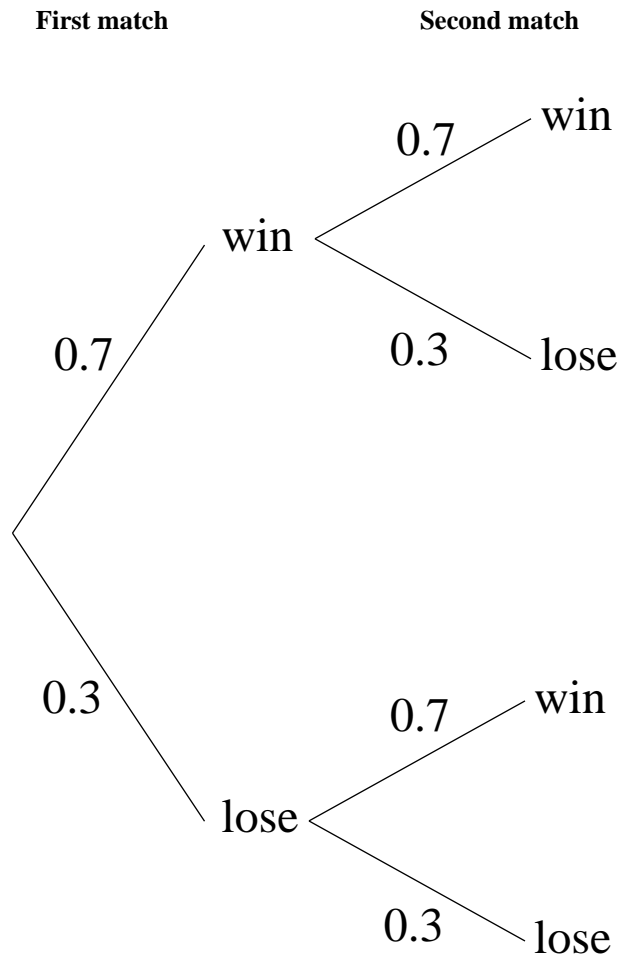
Describe the single transformation that maps shape A onto shape B

[2 marks]

Question 8

Finlay plays two tennis matches.

The probability that he will win a match and the probability that he will lose a match are shown in the probability tree diagram.



- (i) Work out the probability that Finlay wins both matches.

[2 marks]

- (ii) Work out the probability that Finlay loses at least one match.

[2 marks]

Question 9

Here are the marks that James scored in eleven maths tests;

16 12 19 18 17 13 13 20 11 19 17

- (i) Find the interquartile range of these marks.

[3 marks]

Sunil did the same eleven maths test.

The median mark Sunil scored in his tests is 17

The interquartile range is 8

- (ii) Which one of Sunil or James has the more consistent marks ?
Give a reason for your answer.

[1 mark]