# Shrewsbury School

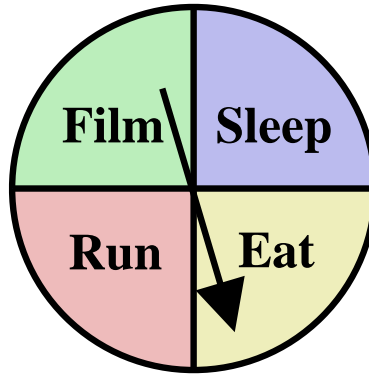## Michaelmas Progress Test
## Year 10 : 4th Form

## Paper 2
## Calculator
## Tuesday  22nd  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**

Hamish uses a biased spinner to decide what to do on a Friday evening.
It can land on "Film", "Run", "Eat" or "Sleep".



Hamish is going to spin the spinner.
The table shows the probabilities of all but one possibility.

| Activity | Film | Run | Eat | Sleep |
|----------|------|-----|-----|-------|
| Probability | 0.35 | 0.15 | 0.2 | |

**( i )**   Complete the table by filling in the missing probability.
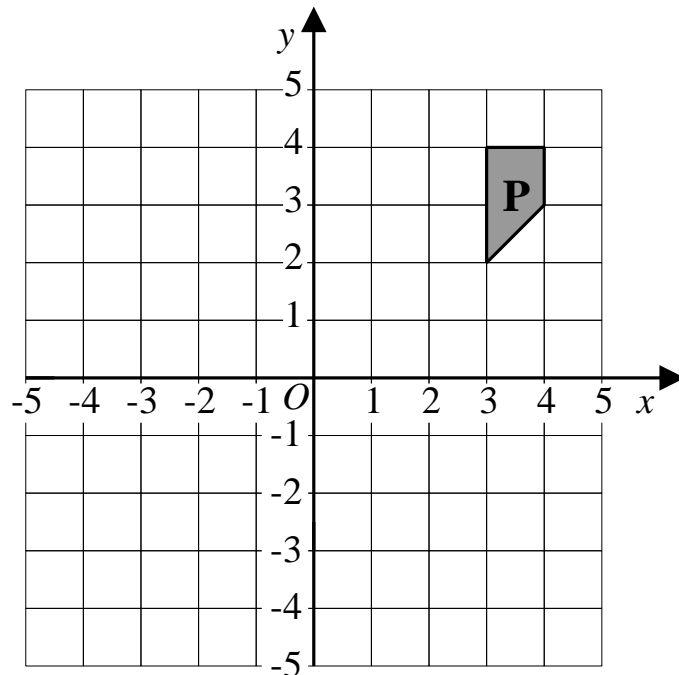
**[ 2 marks ]**

Hamish is going to spin the spinner 80 times.
**( ii )**   Work out an estimate for the number of times it will land on "Film"
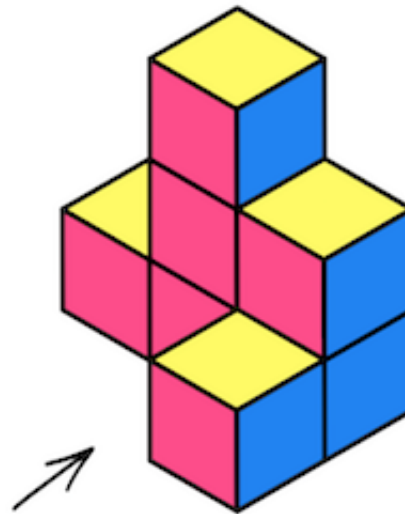
**[ 2 marks ]**

**Question 2**

Reflect shape **P** in the line $x = 1$
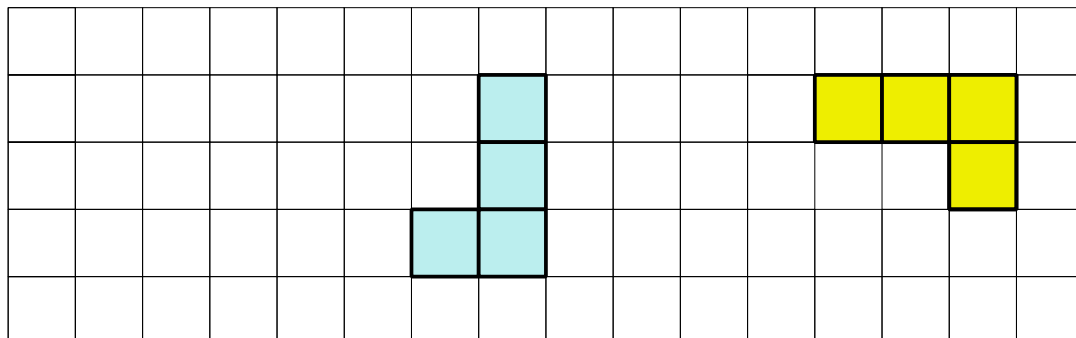


**[ 2 marks ]**

**Question 3**
A three dimensional shape is built from seven cubes as shown.



Front elevation

On the grid below the side elevation and the plan view of the shape have been drawn.

Your job is to draw the front elevation on the grid below.



Front elevation

Side elevation

Plan view

**[ 2 marks ]**

**Question 4**

Amelia rolls this six faced dice 60 times.

The table shows information about her scores.

| Score | Frequency |
|-------|-----------|
| 1 | 12 |
| 2 | 17 |
| 3 | 10 |
| 4 | 9 |
| 5 | 4 |
| 6 | 8 |

**( a )**   Work out the mean score.
To get any marks at all you must show your working.

**[ 3 marks ]**

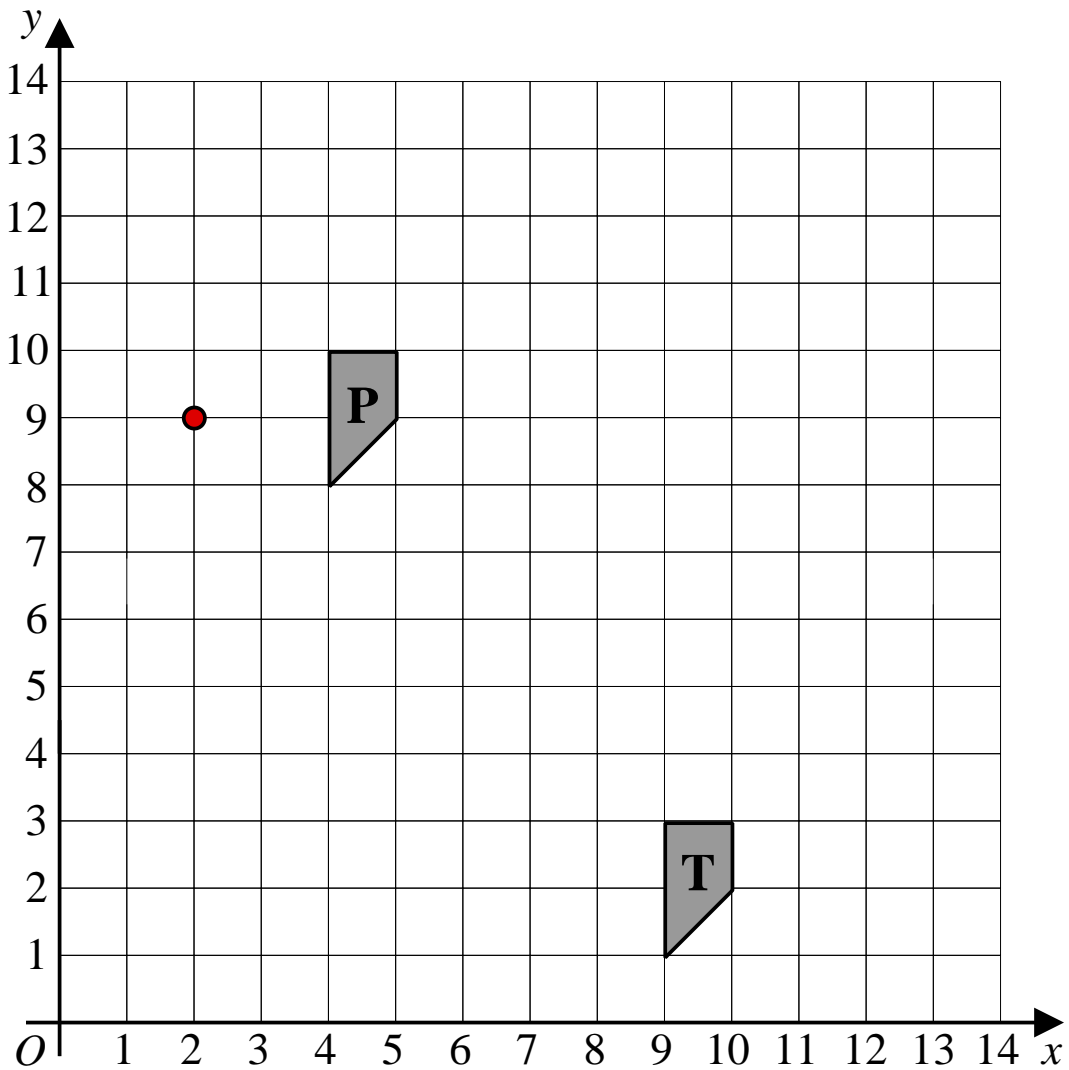**( b )**   Amelia is going to roll the dice once more.
Find an estimate of the probability that she will roll
**( i )**   4

**( ii )**   5 or 6

**[ 3 marks ]**

**Question 5**



( **i** )   On the grid, enlarge the shape **P** with scale factor 3 and centre ( 2, 9 )
Label the new shape **Q**

**[ 2 marks ]**

( **ii** )   Translate shape **P** by $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$

Label the new shape **R**

**[ 2 marks ]**

( **iii** )   Reflect **P** in the line  $y = 6$
Label the new shape **S**

**[ 2 marks ]**

( **iv** )   Give a single transformation that will map shape **P** onto shape **T**

**[ 2 marks ]**

**Question 6**



The weights of 40 three-week-old Labrador puppies were recorded at a vet's clinic. The results are shown in the table below.

| Weight, $w$, kg | Frequency |
|---|---|
| $1.5 \leqslant w < 2.5$ | 3 |
| $2.5 \leqslant w < 3.5$ | 6 |
| $3.5 \leqslant w < 4.5$ | 10 |
| $4.5 \leqslant w < 5.5$ | 12 |
| $5.5 \leqslant w < 6.5$ | 9 |

**( i )**   Write down the modal class interval.

**[ 1 mark ]**

**( ii )**   Calculate an estimate for the mean puppy weight.
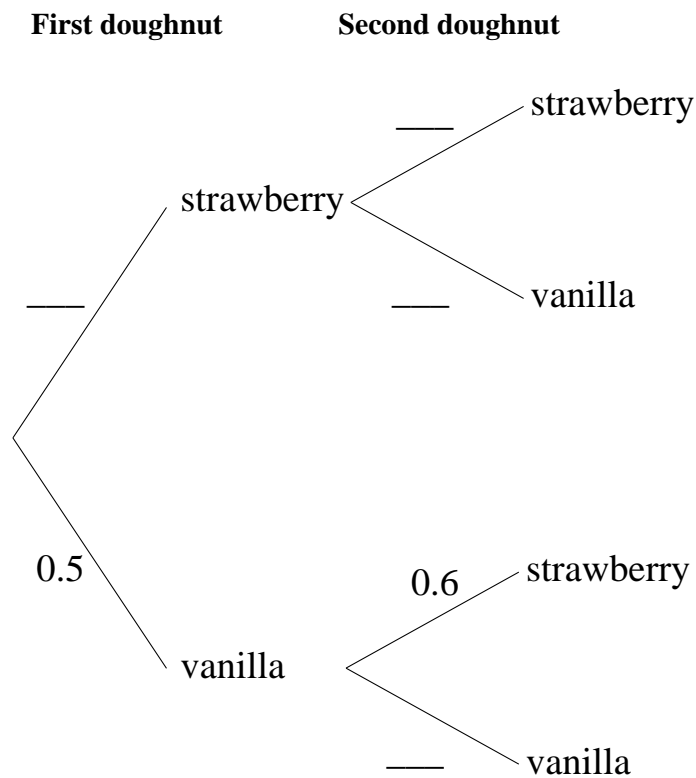
**[ 3 marks ]**

**Question 7**



A box of doughnuts from PlanetDoughnut™ contains three "strawberry sprinkled" and three "vanilla grazed" rings.
George randomly picks a doughnut from the box and eats it.
He then randomly picks another doughnut from the box and eats that too.
**( i )**     Complete the probability tree diagram.

**First doughnut**          **Second doughnut**

                                                    ____  strawberry

                        strawberry  <

                ____                              ____  vanilla

        0.5                              0.6  strawberry

                vanilla  <

                                        ____  vanilla

[ **2 marks** ]

**( ii )**     What is the probability that George ate two strawberry sprikled doughnuts ?

[ **2 marks** ]