Write your name here

Surname	Other names

In the style of:

Edexcel GCSE

Centre Number	Candidate Number

Mathematics A

Scattergraphs

Higher Tier

Past Paper Style Questions
Arranged by Topic

Paper Reference
1MA0/2H

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators may be used.**

Information

- The total mark for this paper is 100
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

1. (a) Andy, Lauren and Noah are playing with a normal fair dice. They each predict the next seven throws.

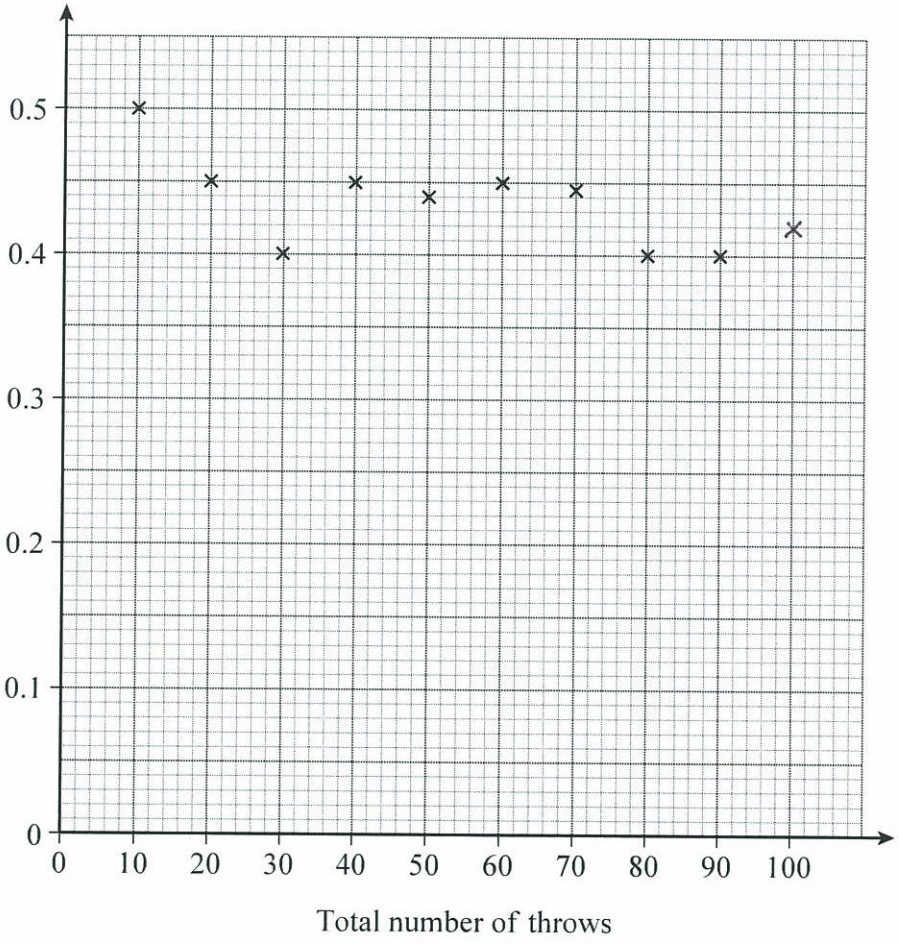
Andy	1	2	1	2	1	2	1
Lauren	3	5	2	2	4	6	1
Noah	4	4	4	4	4	4	4

Which, if any, of these predictions is the most likely?Circle your choice and explain your answer.

Andy Lauren Noah (All are equally likely)

The probability of predicting the next 7 throws in a given order on a fair dice is the same regardless of the sequence of numbers, and is given by $\left(\frac{1}{6}\right)^7$ **(2)**

(b) Nikki makes a six-sided dice.
To test the dice she throws it 100 times.
After each 10 throws she records the number of sixes thrown.
The relative frequencies for the first 90 throws are shown on the graph.



(b) (i) How many sixes were there in the first 10 throws?

$0.5 \times 10 = 5$

(1)

(ii) After 100 throws there were 42 sixes.

Calculate and plot the relative frequency of a six after 100 throws.

$\text{Relative Frequency} = \frac{42}{100} = 0.42$

(1)

(iii) How many sixes would you expect to get after 100 throws of a **fair** dice?

$E(6) = P(6) \times N$

$= \frac{1}{6} \times 100 = 17$ (to nearest integer) 17

(1)

(iv) Is Nikki's dice fair?

Tick the correct box.

☐ Yes ☑ No

Give a reason for your answer.

Conclusions drawn from a finite amount of empirical data can never be verified with 100% certainty.

(1)

However, given a relatively large sample of 100 throws and a relatively large deviation away from the expected frequency of sixes, we can be statistically confident that Nikki's dice is not fair.

(Total 6 marks)

'When one admits that nothing is certain one must, I think, also admit that some things are much more nearly certain than others. It is much more nearly certain that we are assembled here tonight than it is that this or that political party is in the right. Certainly there are degrees of certainty; and one should be very careful to emphasise that fact, because otherwise one is landed in utter scepticism, and complete scepticism would, of course, be totally barren and completely useless.'

— Bertrand Russell.