

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

Pi Academy

Predicted Papers - Set 2

Morning (Time: 1 hour 30 minutes)

Mathematics

Paper 2 (Calculator)

Foundation Tier

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.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.



Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

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 ►



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1** (a) Change 85 mm to cm.

.....cm

(1)

- (b) Change 88500 millilitres to litres.

.....litres

(1)

- (c) Change 0.78 kilograms to grams.

.....grams

(1)

(Total for Question 1 is 3 marks)

- 2** Work out the value of $\frac{3^{10} \times 3^{-3}}{3^4}$

.....

(Total for Question 2 is 2 marks)

3 Write a column vector which is two units right and one unit up to the vector **a**.

$$\mathbf{a} = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$$

.....

(Total for Question 3 is 1 mark)

4 When a coin is dropped it can land on heads or tails. Lorry, Michelle and Tony each dropped the coin a number of times.

The table shows the number of times the coin landed on heads and the number of times the coin landed on tails for each person.

	Lorry	Michelle	Tony
Heads	40	50	10
Tails	15	26	9

Rosie is going to drop the coin once.

(a) Whose results will give the best estimate for the probability that the coin will land on heads?

.....
.....

(1)

Sherlin is going to drop the coin twice.

(b) Use all the results in the table to work out the estimate for the probability that the coin will land heads the first time and tails the second time.

.....

(2)

(Total for Question 4 is 3 marks)

5 Make a the subject of the formula $v = u + at$

.....

(Total for Question 5 is 2 marks)

6 Julia is thinking of two numbers **greater than 10**.

She says: “The highest common factor (HCF) of my two numbers is 8

The lowest common multiple (LCM) of my two numbers is 96”

Write down the two numbers that Julia is thinking of.

.....

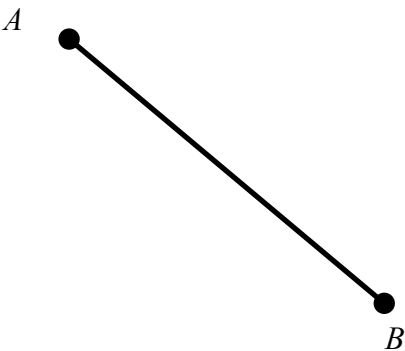
(Total for Question 6 is 3 marks)

7 If $x : y = 3 : 4$, find the value of $(2x + 3y) : (x + 4y)$.

.....

(Total for Question 7 is 2 marks)

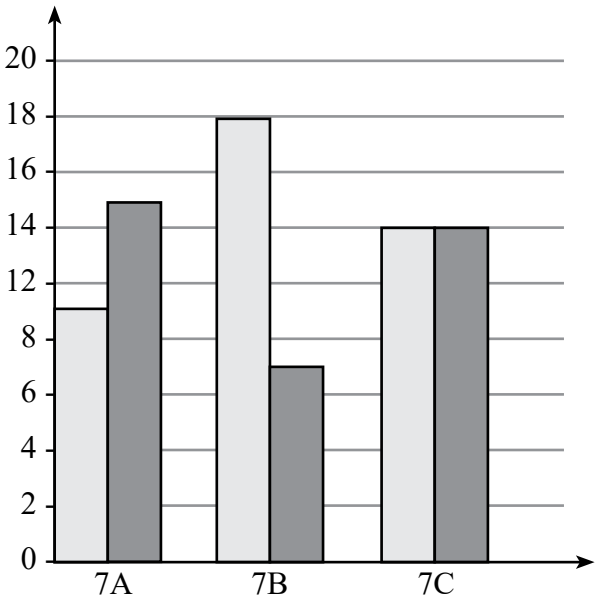
8 The bearing of B from A is 300° , find the bearing of A from B .



..... $^\circ$

(Total for Question 8 is 2 marks)

9 The bar chart shows information about the number of boys and girls in three tutor groups, 7A, 7B and 7C.



Write down **three** things that are wrong with this graph.

- 1
- 2
- 3

(Total for Question 9 is 3 marks)

10 (a) Simplify $(\frac{y^7 \times y^8}{y^2 \times y^1})$

.....

(2)

(b) Simplify $(2m^3n)^4$

.....

(2)

(Total for Question 10 is 4 marks)

- 11** The length of a rope was originally 720 cm. It was reduced in the ratio 8 : 5.
The rope with the new reduced length is coiled around a square.
Find the length of the square.

.....cm

(Total for Question 11 is 3 marks)

- 12** Write the following fractions in order of size.
Start with the smallest fraction.

$$\frac{12}{20} \quad \frac{2}{5} \quad \frac{3}{8} \quad \frac{21}{30} \quad \frac{16}{64}$$

.....
(Total for Question 12 is 2 marks)

- 13** Write the ratio $3.5 : 0.75$ in the form of $n : 1$.

.....
(Total for Question 13 is 1 mark)

- 14** Mr Wilson has 5 pairs of trousers, 9 shirts and x ties.

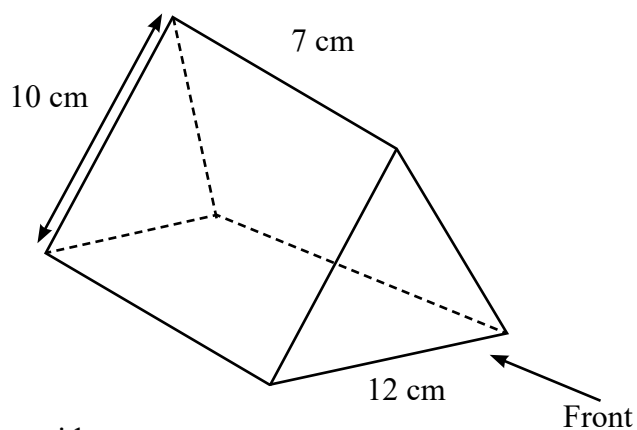
He says there are 225 different ways of choosing a pair of trousers, a shirt and a tie.

Could Mr Wilson be correct?

You must show your working.

.....
(Total for Question 14 is 3 marks)

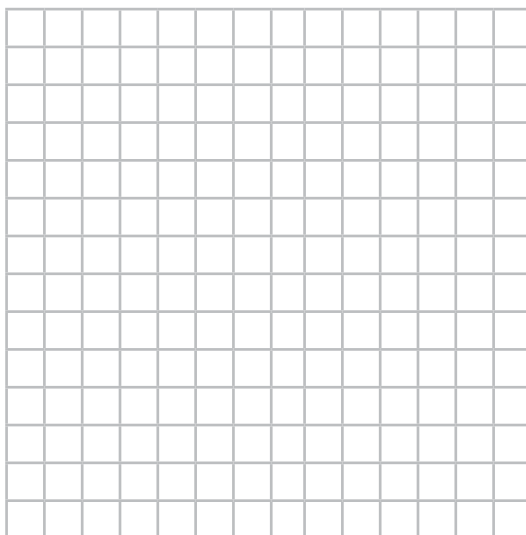
15 A triangular prism is shown below.



For the above prism, draw on the grid:

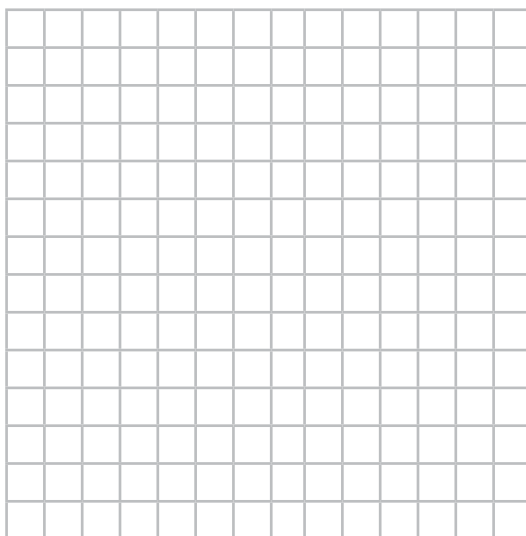
(a) Front elevation

Use scale 1 unit = 1 cm



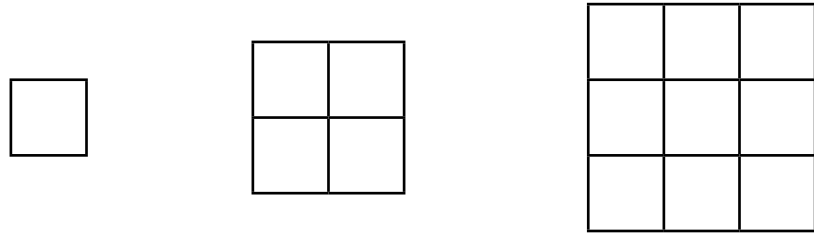
(b) Plan view

Use scale 1 unit = 1 cm



(Total for Question 15 is 2 marks)

16 Below given are the first three patterns of a sequence.



(a) Draw the next pattern in the sequence.

(1)

(b) How many squares are there in the 8th pattern in the sequence? Give a reason for your answer.

.....

.....

.....

.....

(2)

(Total for Question 16 is 3 marks)

17 A biased 5- sided spinner is numbered 1-5.
The probability that the spinner will land on each of the numbers 1 to 5 is given in this table.

Number	1	2	3	4	5
Probability	0.2	0.25	0.3	0.1	0.15

(a) What is the probability of the spinner landing on a 3 or a 4?

.....

(2)

(b) The spinner is spun thrice. What is the probability that it will land on a 1 on the first spin and a 2 on the second spin and on a 3 on the third spin?

.....
(2)

(Total for Question 17 is 4 marks)

18 Harry buys

three balls costing £9.
one bat costing £20.
three identical rugby balls.

Harry pays with a £100 note.

He gets £20 change.

Work out the cost of one rugby ball.

.....
(Total for Question 18 is 3 marks)

19 Peter wants to buy 20 tins of paint, 25 paint brushes, 40 paint rollers and 6 mixing pans.

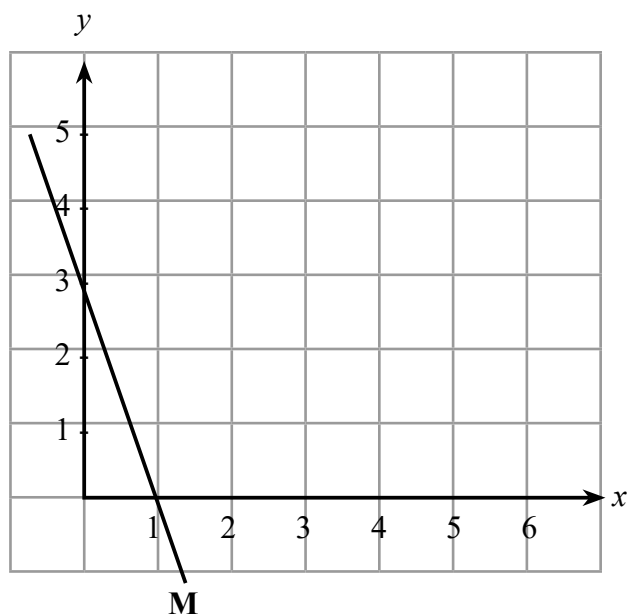
Price List	
Paint	15 tin for £400
Paint brush	5 for £85
Paint rollers	8 for £45
mixing pans	a dozen for £18

What is the total amount that Peter spends?

£.....

(Total for Question 19 is 5 marks)

20 Line **M** is shown below.

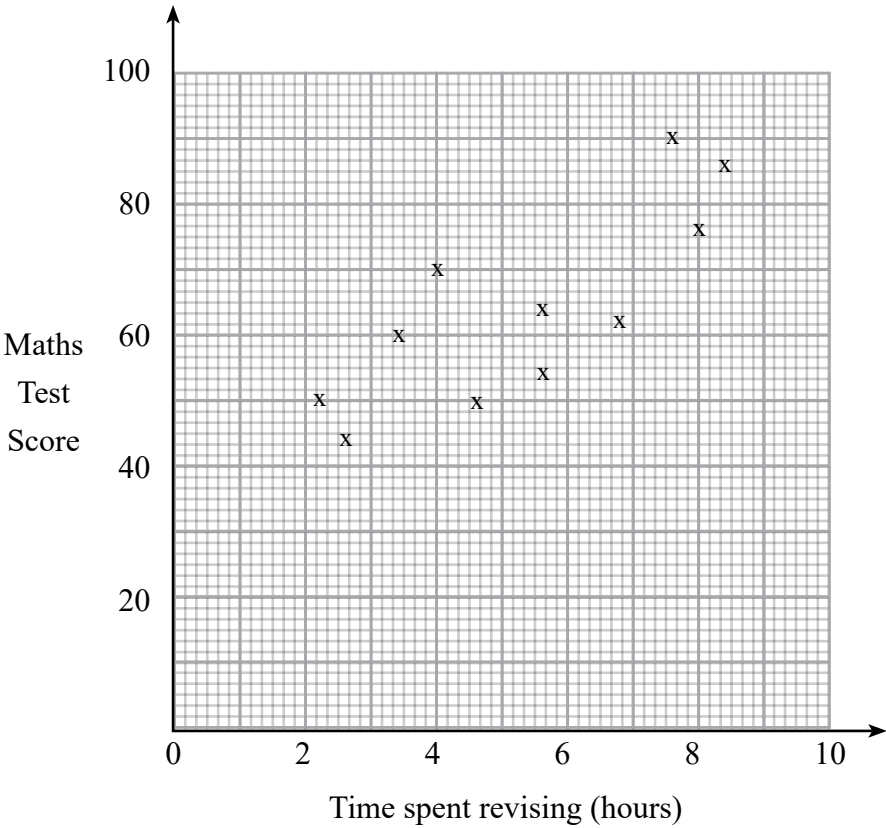


Another line **L** is parallel to line **M** and passes through the point (3,3).
Find the equation for line **L**.

.....

(Total for Question 20 is 5 marks)

21 The scatter graph shows information about the test scores of some students in Maths and the number of hours they spend revising for the Maths test.



(a) What type of correlation does this scatter graph show?

.....
(1)

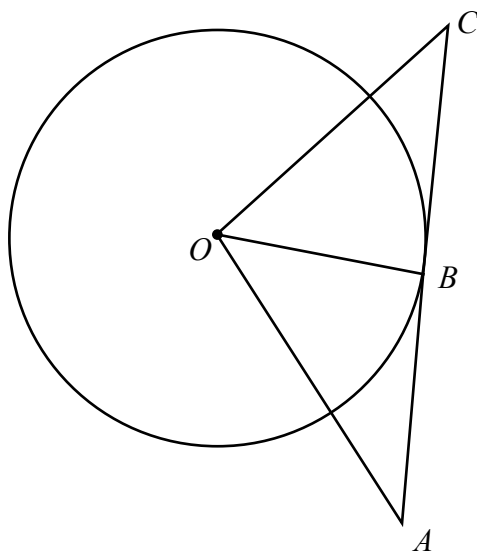
Meryl says
“ If I increase the amount of time revising for the test my Maths test score will improve.”

(b) Comment on what Meryl says.

.....
.....
(2)

(Total for Question 21 is 3 marks)

22 In the figure shown below, AC is the tangent of the circle with centre O .



(a) What is the measure of angle OBA ?

Give reasons for your answer.

.....

.....

(2)

(b) If $AB = CB$, then prove that triangle OAB is congruent to triangle OCB .

.....

(2)

(Total for Question 22 is 4 marks)

23 In a bag there are black pens and green pens. The ratio of black pens to green pens is 2 : 5.

What fraction of the pens are black?

.....

(Total for Question 23 is 2 marks)

24 Solve $x^2 + 5x + 6 = 0$

.....

(Total for Question 24 is 3 marks)

25 (a) Work out $\frac{11}{20} - \frac{3}{8}$

.....

(2)

(b) Work out $2\frac{4}{7} \div 4\frac{2}{9}$

.....

(2)

(Total for Question 25 is 4 marks)

26 Ronald buys a tractor for £7200 plus an additional VAT of 30% is applied on it.
Ronald pays a deposit for the tractor.
He then pays the rest of the cost in 14 equal payments of £620 each month.

Find the ratio of the deposit Ronald pays to the total of the 14 equal payments.
Give your answer in its simplest form.

.....

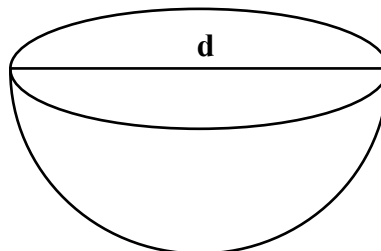
(5)

(Total for Question 26 is 5 marks)

27 Find the volume of a hemisphere whose diameter is 9 cm.

Give your answer in terms of π .

The volume of a hemisphere = $\frac{2}{3}\pi r^3$



.....cm³

(Total for Question 27 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS