

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 3 (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 Convert the given fractions to recurring decimals.

(a) $\frac{4}{6}$

.....

(1)

(b) $\frac{2}{9}$

.....

(1)

(Total for Question 1 is 2 marks)

2 Here is a list of numbers.

12 9 7 15 20 11

Work out the median.

.....

(Total for Question 2 is 1 mark)

3 Write these ratios in their simplest form.

(a) 12 : 45

.....

(1)

(b) 343 : 42

.....

(1)

(Total for Question 3 is 2 marks)

4 Ricky has 10 cards, each with a number on it.

0	1	2	3	4	5	6	7	8	9
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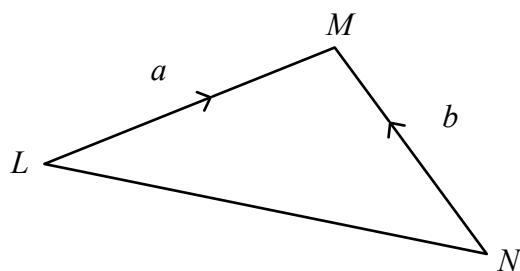
He picks a card at random.

Write down the probability that the chosen card is an odd number.

.....

(Total for Question 4 is 2 marks)

- 5 Find vector $\vec{LN}$ on the diagram below.



.....

(Total for Question 5 is 1 mark)

- 6 (a) Factorise $24y + 30$

.....

(1)

- (b) Factorise $y^2 - 100$

.....

(2)

(Total for Question 6 is 3 marks)

- 7 Jacob rounds a number, y , to one decimal place.
The result is 5.4

Write down the error interval for y .

.....

(Total for Question 7 is 2 marks)

- 8 There are 12 counters in a bag, 8 are red and 4 are green.

Mac, Joe and Alex select a counter each. Mac goes first then Joe and finally Alex. Each time a counter is selected it is replaced.

Calculate the probability that Mac, Joe and Alex all select red counters.
Give your answer correct to two decimal places

.....

(Total for Question 8 is 3 marks)

9 Divide £5600 in the ratio 3 : 4.

£ : £

(Total for Question 9 is 2 marks)

10 The frequency table shows the time taken for 80 people to travel to an event.

Time (minutes)	Frequency
$0 < t \leq 10$	8
$10 < t \leq 20$	15
$20 < t \leq 30$	24
$30 < t \leq 40$	20
$40 < t \leq 50$	9
$50 < t \leq 60$	4

(a) Work out the percentage of people who travelled less than 30 minutes.

..... %

(1)

(b) Find the class interval that contains the median.

..... minutes

(1)

(c) Estimate the mean time taken by the people to travel to the event.

..... minutes

(3)

(Total for Question 10 is 5 marks)

- 11** Maria drinks an average of 3.6 litres of water per week.
Work out an estimate for the amount of water Maria drinks in a year.

..... litres

(Total for Question 11 is 2 marks)

12 Dean wants to make some cocktails.

He mixes lime juice, water and cranberry juice in the ratio 5 : 3 : 7.

(a) What fraction of the cocktail is water?

.....

(1)

(b) If he makes 4.5 litres of this cocktail, find the amount of cranberry juice in it.

.....

(2)

(Total for Question 12 is 3 marks)

- 13** Use a ruler and compasses to construct an accurate 30° angle at A.
Make sure you show all your construction lines

A



.....

(Total for Question 13 is 2 marks)

- 14** Find an expression for the perimeter of the rectangle shown below.



$(x + 1) \text{ cm}$

$(2x + 3) \text{ cm}$

Figure not drawn to scale

..... cm

(Total for Question 14 is 2 marks)

15 Camila buys

two pens each costing 85p
one paper costing 72p
two identical candy bars.

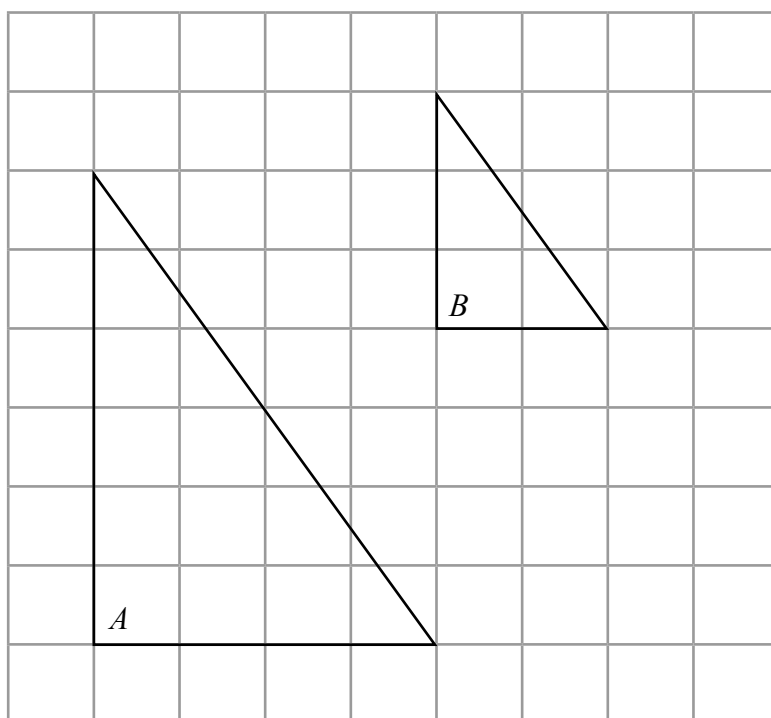
Camila pays with a £5 note.
She gets 30p change.

Work out the cost of one candy bar.

£

(Total for Question 15 is 3 marks)

16 The grid below shows two shapes, *A* and *B*.



Work out the ratio of

(a) Shortest side of shape *B* to the shortest side of shape *A*.

.....

(1)

(b) Area of shape *A* to the area of shape *B*.

.....

(2)

(Total for Question 16 is 3 marks)

- 17 $\frac{7}{9}$ of the students in a class are girls and the rest are boys.

Write down the ratio of girls to boys in the class.

.....

(Total for Question 17 is 1 mark)

- 18 Here are the first four terms of a sequence

10 4 -2 -8

- (a) Write down the next term of the sequence.

.....

(1)

- (b) Find the n th term of the sequence.

.....

(1)

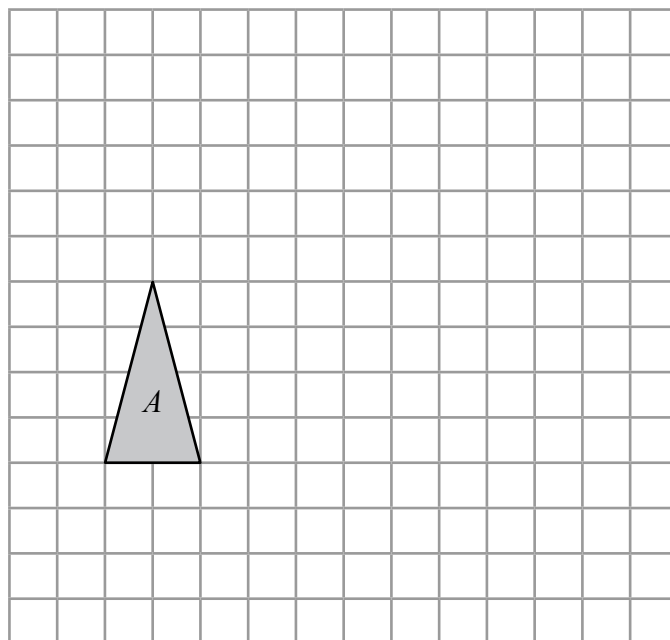
- (c) Work out the 11th term of the sequence.

.....

(1)

(Total for Question 18 is 3 marks)

19 The diagram shown below is a centimetre grid.



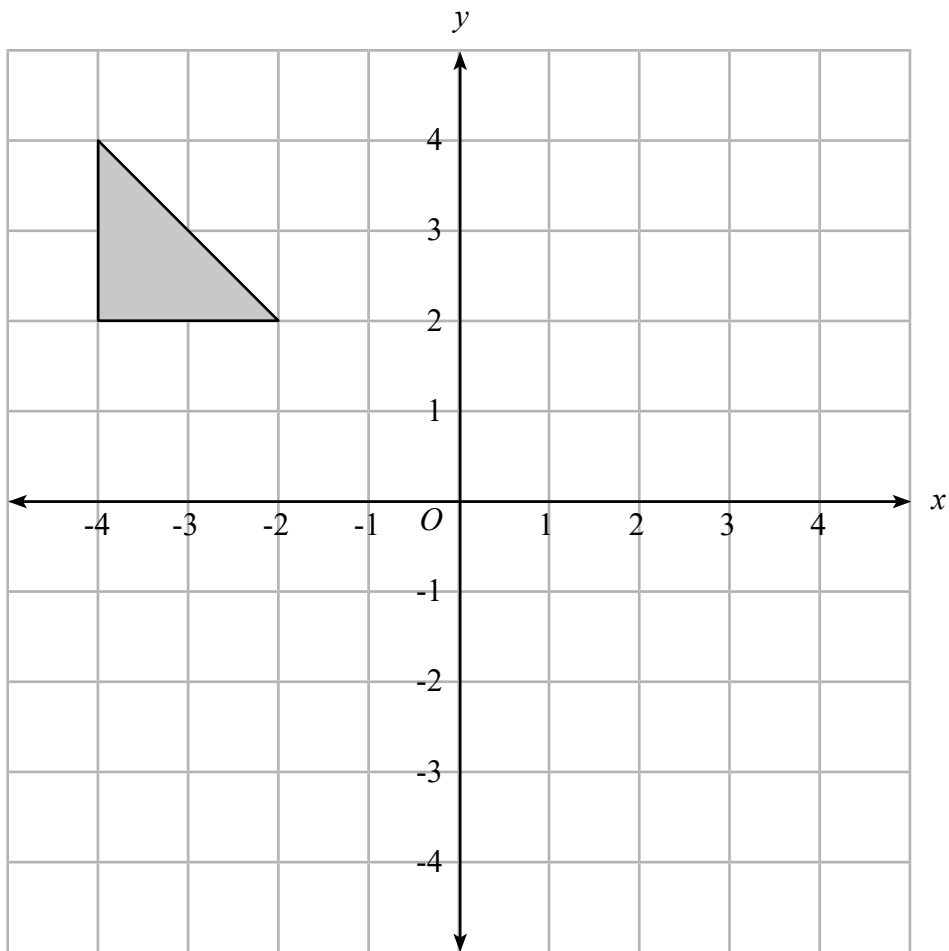
(a) Draw a triangle similar to triangle A with scale factor of 2.

(2)

(b) If the base of the triangle A represents 6 m, workout the scale used in drawing the triangle.

1 cm to m

(1)



(c) Rotate the shape 180° anticlockwise about the centre O.

(2)

(Total for Question 19 is 5 marks)

20 Here are the ages of factory workers.

19	20	22	18	20	21	21	45
30	37	42	50	42	58	31	45
60	33	35	41	27	27	30	31

- (a) Draw an ordered stem and leaf diagram to show this information.
You must include a key.

(2)

One of the workers is selected at random.

- (b) Find the probability that they are younger than 35.

.....
(2)

(Total for Question 20 is 4 marks)

21 When $m = 18$, $n = 6$ and when $m = 24$, $n = 8$.

(a) Sean says that m is inversely proportional to n . Is he correct?

.....
(2)

(b) If $m = 360$, find n .

(2)

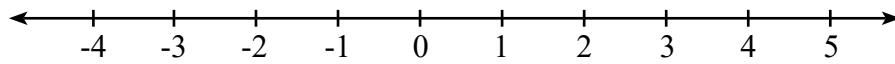
(c) When $m = 124$, $n = 4$.

If $m = A \times n$, find the value of A .

$A =$
(1)

(Total for Question 21 is 5 marks)

22 (a) Show the inequality $-2 \leq x < 4$ on the number line.



(1)

(b) Solve the simultaneous equations

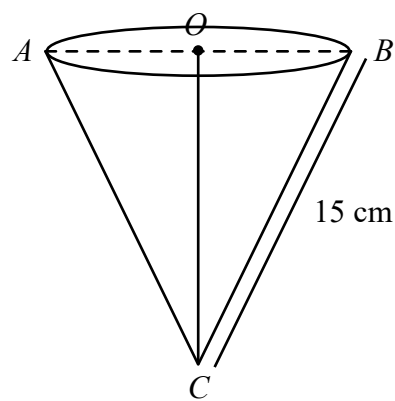
$$2x + 3y = -8$$

$$3x + 5y = -14$$

.....
(3)

(Total for Question 22 is 4 marks)

23 Given below is a right circular cone of radius 4 cm.



Surface area of a cone = $\pi r l + \pi r^2$

(a) Work out the surface area of the cone.

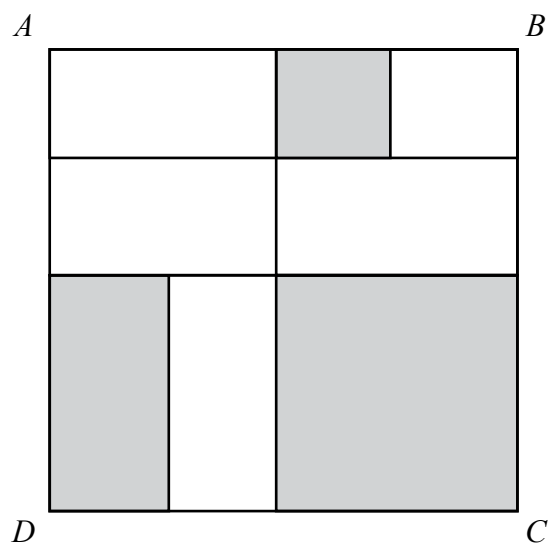
..... cm²
(3)

(b) Work out the height OC of the cone.

..... cm
(2)

(Total for Question 23 is 5 marks)

- 24** $ABCD$ is a square.
What fraction of the square $ABCD$ is shaded?



.....

(Total for Question 24 is 3 marks)

- 25** Find the value of $(3.60 \times 0.75)^3 + \sqrt[3]{9.261}$

.....

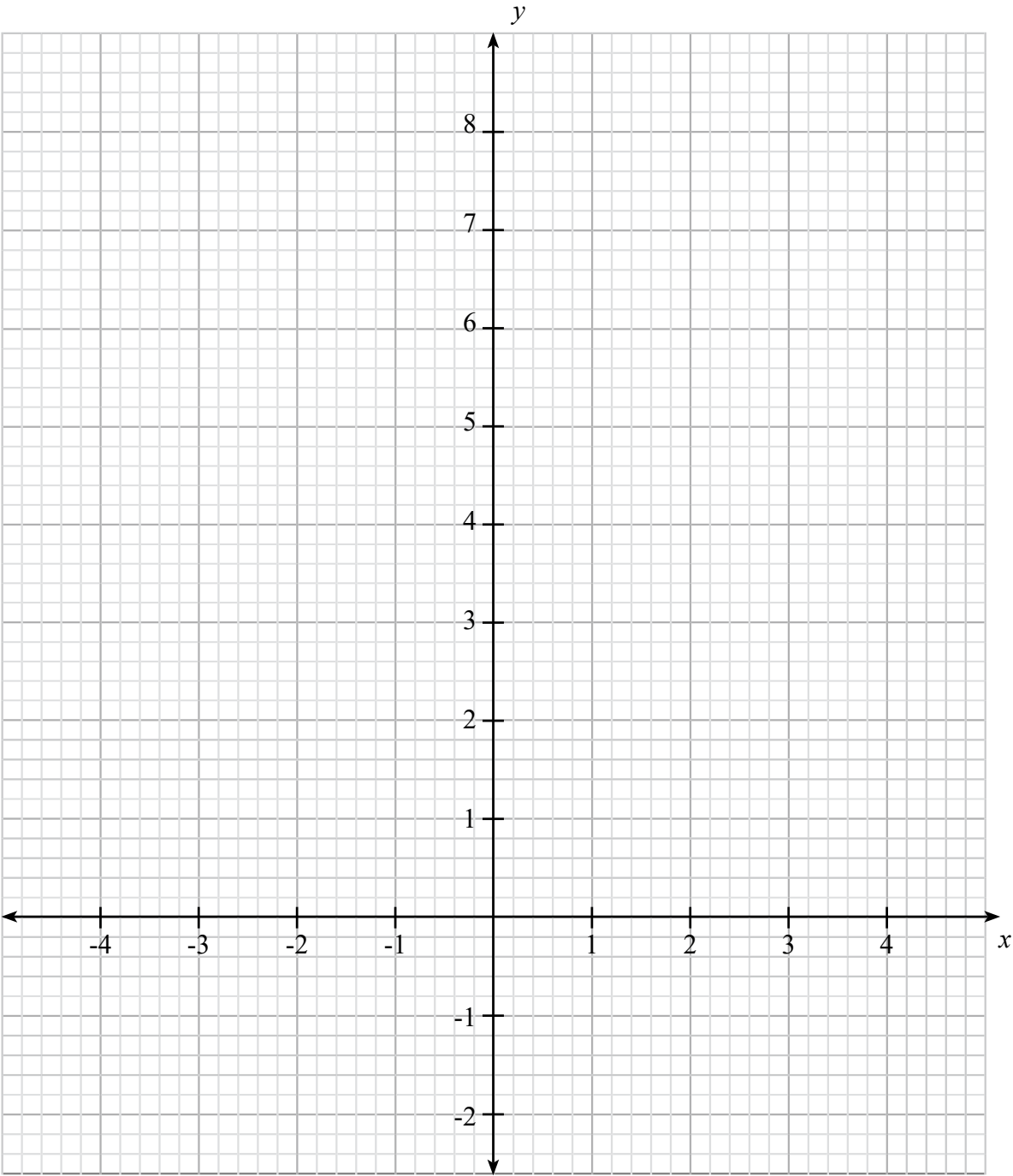
(Total for Question 25 is 2 marks)

26 (a) Complete the table below for $y = x^2 + 2x$

x	-2	-1	0	1	2
y	0				8

(2)

(b) On the grid below, draw the graph of $y = x^2 + 2x$ for values of x from -2 to 2



(2)

(Total for Question 26 is 4 marks)

27 Work out $\frac{17.4 \times 10^5 \times 7.3 \times 10^4}{2 \times 10^{-6}}$

.....

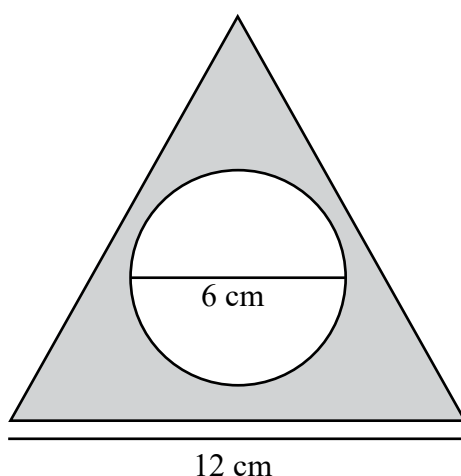
(Total for Question 27 is 2 marks)

28 Write brackets () in this statement to make it correct. You may use more than one pair of brackets.

$$9 - 6 \times 2 + 4 = 18$$

(Total for Question 28 is 1 mark)

29 The diagram below shows a triangle with a circle inside. The area of the shaded region is 25.74 cm^2 . Calculate the height of the triangle.



..... cm

(Total for Question 29 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS