

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

Pi Academy

Predicted Papers - Set 1

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** Write 412×100000 in standard form.

.....

(Total for Question 1 is 1 mark)

- 2** There are y balls in a bag.

There are 10 bags.

Write an expression, in terms of y , for the total number of balls.

.....

(Total for Question 2 is 1 mark)

3 $p = \begin{pmatrix} 6 \\ -a \end{pmatrix}$ $q = \begin{pmatrix} b \\ 7 \end{pmatrix}$

Given $p + q = \begin{pmatrix} -9 \\ 2 \end{pmatrix}$

Work out the values of a and b .

$a =$

$b =$

(Total for Question 3 is 2 mark)

4 The table below shows the probabilities of a biased dice landing on numbers 1 to 6, respectively

Number on dice	1	2	3	4	5	6
Probability	0.04	0.23	0.08	0.15	0.21	

Milo rolls the biased dice 300 times.
Work out an estimate for the total number of times the dice will land on 6.

.....

(Total for Question 4 is 2 mark)

5 (a) Simplify $3 \times p \times 4 \times q$

.....

(1)

(b) Simplify $5m + n - 3n + m$

.....

(1)

(c) Simplify $y(y^2 + y^2)$

.....

(1)

(Total for Question 5 is 3 mark)

- 6 Below is a list of numbers. Write down two prime numbers whose sum is a multiple of 11.

2 5 8 16 13 19 23 47

.....

(Total for Question 6 is 3 mark)

- 7 The scale diagram shows two ships *A* and *B*.

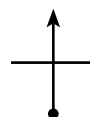
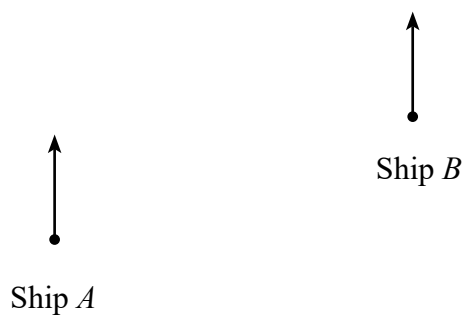


Diagram drawn accurately

Scale: 1 cm represents 15 km

- (a) Work out the distance between *A* and *B* in km.

.....km

(2)

- (b) Find the bearing of *B* from *A*.

.....

(1)

(Total for Question 7 is 3 mark)

- 8 $p = 3x + 4y$
 $x = 5$ and $y = -1$
Find the value of p .

.....

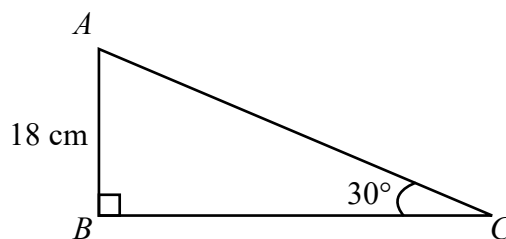
(Total for Question 8 is 2 mark)

- 9 (a) Write down the exact value of $\cos(60^\circ)$.

.....

(1)

- (b) Calculate the length AC .



.....cm

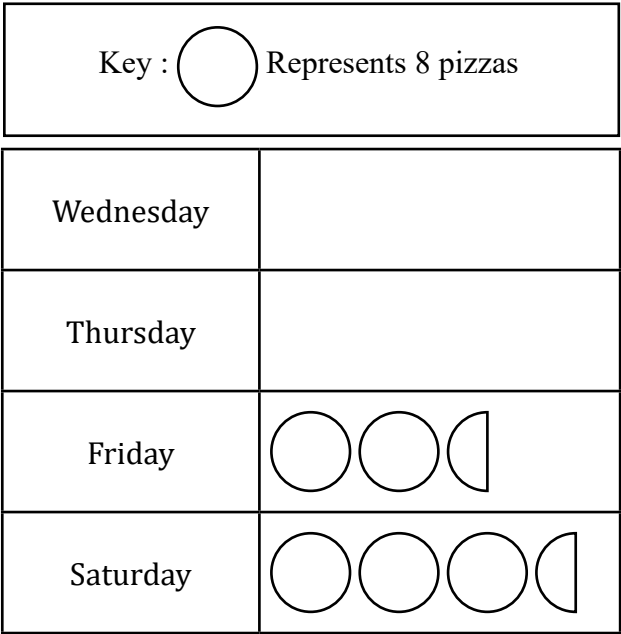
(1)

(Total for Question 9 is 2 mark)

10 Sum of the squares of three numbers is 110. Two of the numbers are -6 and 5.
What is the third number?

.....
(Total for Question 10 is 3 mark)

11 The pictogram shows information about the number of pizzas sold by a shop on Friday and Saturday.



Write down the number of pizzas sold
(i) On Friday

.....
(1)

(ii) On Saturday

.....

(1)

On Wednesday and Thursday, a total of 32 pizzas were sold. The number of pizzas sold on Thursday was 3 times the number of pizzas sold on Wednesday.

(b) Use this information to complete the pictogram.

(3)

(Total for Question 11 is 5 marks)

12 There are 56 bottles in a bag.

28 of the bottles are yellow.

12 of the bottles are blue.

The rest of the bottles are green.

(a) What fraction of the bottles are green?

.....

(2)

- (b) Work out the ratio of the number of yellow bottles to the number of blue bottles to the number of green bottles.

Give your answer in its simplest form.

.....

(2)

(Total for Question 12 is 4 marks)

- 13** (a) Complete the following sentences.

- (i) Write down the number of edges of a cuboid.

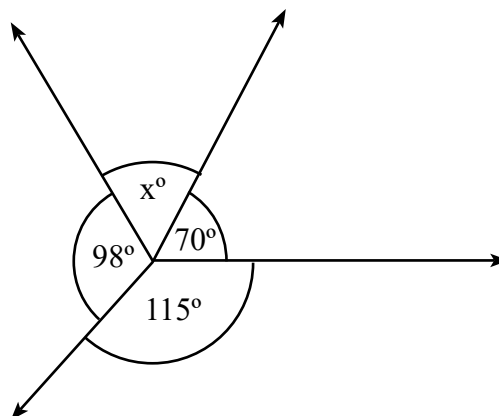
.....

(1)

- (ii) Write down the sum of exterior angles of a regular octagon.

.....

(1)



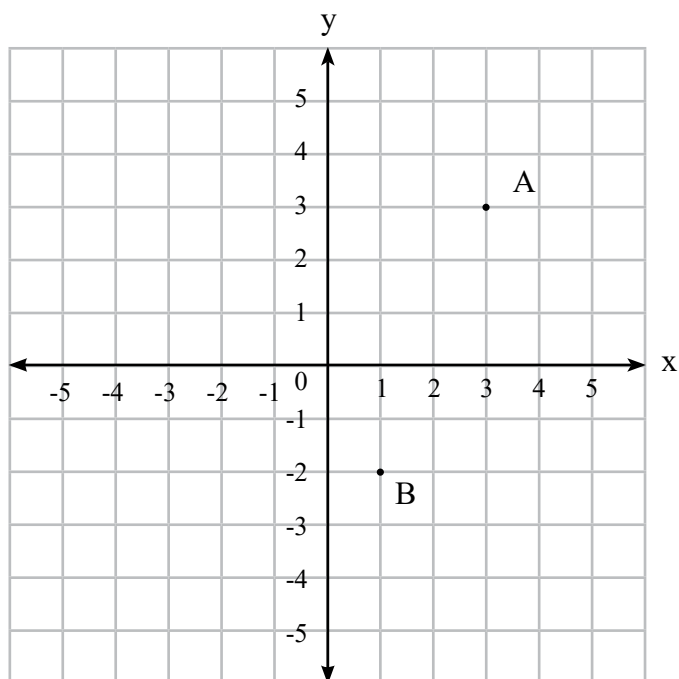
- (b) Work out the size of the angle marked x.

.....°

(2)

(Total for Question 13 is 4 marks)

14



(a) Write down the coordinates of points A and B.

A (..... , ...)

B (..... , ...)

(1)

(b) Find the coordinates of the midpoint of AB.

(..... , ...)

(1)

(c) On the grid, draw the line with equation $y = 2$

(1)

(Total for Question 14 is 3 marks)

15 Here is a stem and leaf diagram showing the ages of some cricketers.

1	7	9					
2	0	2	2	3	5	7	7
3	0	1	3	3	4		

1 Key:
1 | 7 = 17 years old

(a) Work out the range.

.....

(1)

(b) Work out the median age.

.....

(1)

(Total for Question 15 is 2 marks)

16 Solve $4x - 5 = 17$

.....

(Total for Question 16 is 2 marks)

17 (a) Work out 352% of 200.

.....

(2)

(b) In a sale, the cost of a t-shirt is reduced by 10%. It now costs £5.40.

Work out the original price of the t-shirt.

£.....

(2)

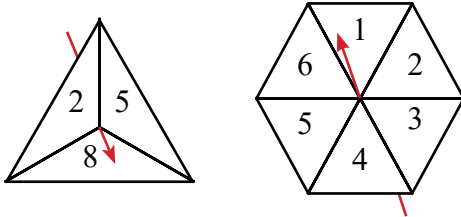
(Total for Question 17 is 4 marks)

18 John plays football every 6 days and Lara plays football every 20 days. If John and Lara both played football today, how many days will it be until they both play football again on the same day?

..... days

(Total for Question 18 is 3 marks)

19 Here are a 3-sided spinner and a 6-sided spinner.
The spinners are fair.



Cam is going to spin each spinner once.
Each spinner will land on a number.
Cam will get his score by adding these two numbers together.
(a) Complete the probability space diagram for each possible score.

(1)

6-sided spinner

3-sided spinner

	1	2	3	4	5	6
2	3	4	5	6	7	8
5						
8						

Cam spins each spinner once.
(b) Find the probability of Cam getting a score of 10 or more.

(2)

(Total for Question 19 is 3 marks)

20 (a) Work out $\frac{3}{4}$ of $\sqrt{64}$

.....

(1)

Stuart has to work out the exact value of $\sqrt{25} + \sqrt{81}$

He writes

$$\sqrt{25} + \sqrt{81} = \sqrt{106}$$

(b) Explain what is wrong with Stuart's working,

.....

.....

(1)

(Total for Question 20 is 2 marks)

21 Here is a square.

$(2x + 10)$ cm

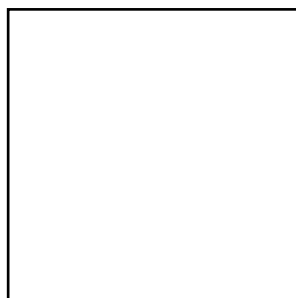


Figure not
drawn to scale

$(4x - 8)$ cm

Work out the side of the square in cm.

.....cm

(Total for Question 21 is 3 marks)

22 Write down an example to show that each of the following statements is not correct.

(a) Cubing an integer always gives a positive number.

.....
(1)

(b) All the square numbers are even.

.....
(1)

(c) Numbers ending in 1, 3, 7, or 0 are prime numbers.

.....
(1)

(Total for Question 22 is 3 marks)

23 The mass of an object is 200 kg and its volume is 40 m^3 .

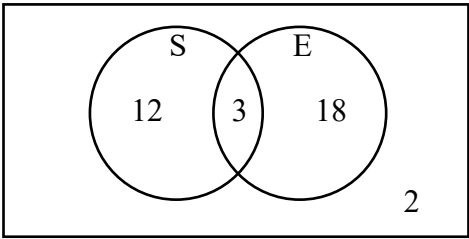
According to Stella, “If the mass is increased by 20 kg and the volume increased by 10 m^3 , the density of the object decreases by 12%”

Show that Stella is correct.

(3)

(Total for Question 23 is 3 marks)

24 Students were polled on their preference between Science and English classes. The results are displayed in the Venn Diagram below.



(a) What is the probability that a student preferred English?

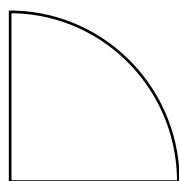
.....
(1)

(b) What is the probability that the student did not prefer Science?

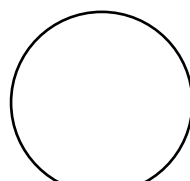
.....
(1)

(Total for Question 24 is 2 marks)

25



A



B

Shape *A* is a quarter-circle which has a radius of 20 cm.

Shape *B* is a circle.

The area of shape *A* is 4 times the area of shape *B*.

Show that the radius of shape *B* is 5 cm.

(4)

(Total for Question 25 is 4 marks)

26 Here are the first three terms of a sequence.

$$14 \quad 10 \quad 4$$

Find the first two terms in the sequence that are less than zero.

.....

(Total for Question 26 is 2 marks)

27 Write the following numbers in the order of size.

$$0.35 \quad 0.3\dot{5} \quad 0.\dot{3}\dot{5}$$

Start with the smallest number.

.....

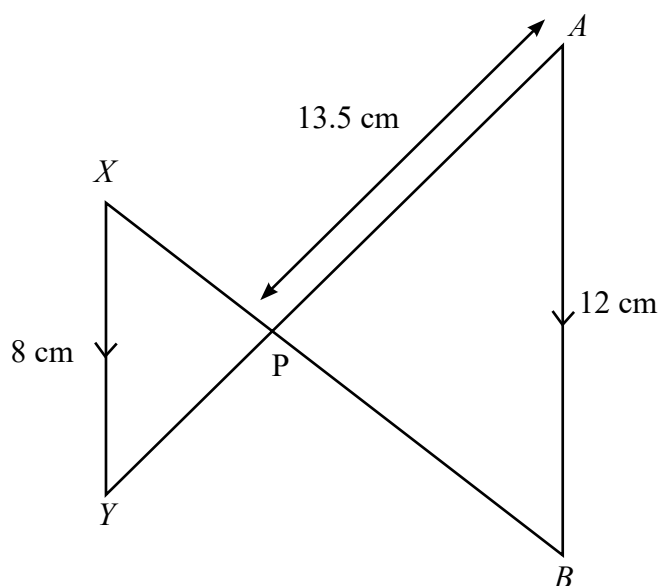
(Total for Question 27 is 1 marks)

28 The diameter of a football, d , is 8.6 inches correct to one decimal place.
Write down the error interval for the diameter of the football.

$$\dots\dots\dots \leq d < \dots\dots\dots$$

(2)

(Total for Question 28 is 2 marks)



Not drawn
to scale

XY is parallel to AB .

The lines XB and YA intersect at P .

$XY = 8$ cm

$AB = 12$ cm

$AP = 13.5$ cm

Work out the length of YP .

.....cm

(3)

(Total for Question 29 is 3 marks)

30 (a) Estimate the value of $\sqrt{(3122 \div 28)} \times \frac{1}{\sqrt{107}}$

.....

(2)

(b) Round 807.06 to two significant figures.

.....

(1)

(Total for Question 30 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS