

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 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.

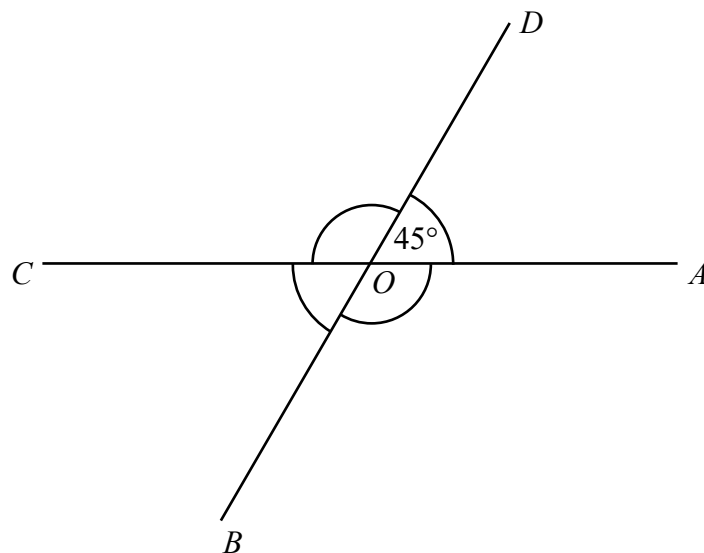
You must write down all the stages in your working.

1 Write down a multiple of 7 that is between 80 and 90

.....

(Total for Question 1 is 1 mark)

2



In the above figure, if angle AOD is 45° , find the measures of angle BOC and angle DOC .
Give reasons at each stage for your working.

..... $^\circ$ and $^\circ$

(Total for Question 2 is 2 marks)

- 3 Adam and James want to buy some accessories to decorate the common room at college. Both of them decide to do a sponsored charity run to raise money for it. A few people gave them a fixed amount of money while the others decided to give them money for every mile they ran.

Adam and James submitted their following sponsor applications:

Adam's form:

Name	Mode	Total
Brian	£2 per mile	
Bianca	£30	
Bony	£1 per mile	

James' form:

Name	Mode	Total
Arthur	£20	
Molly	£3 per mile	

The ratio of miles covered by Adam and James is 2:3 and the total amount earned by them is £125. How many miles did they run together?

..... miles

(Total for Question 3 is 3 marks)

- 4 Josh is a property dealer. The probability that he sells a property on Monday is 0.7. The probability that he sells a property on Wednesday is 0.8.
What is the probability that he sells a property on both Monday and Wednesday?

.....

(Total for Question 4 is 2 marks)

- 5 There were 48 ice-creams in a freezer.
Leo took 23 ice-creams out of the freezer.
Emily put 17 ice-creams into the freezer.
How many ice-creams are now in the freezer?

.....

(Total for Question 5 is 2 marks)

6 $ABCD$ is a rectangle.

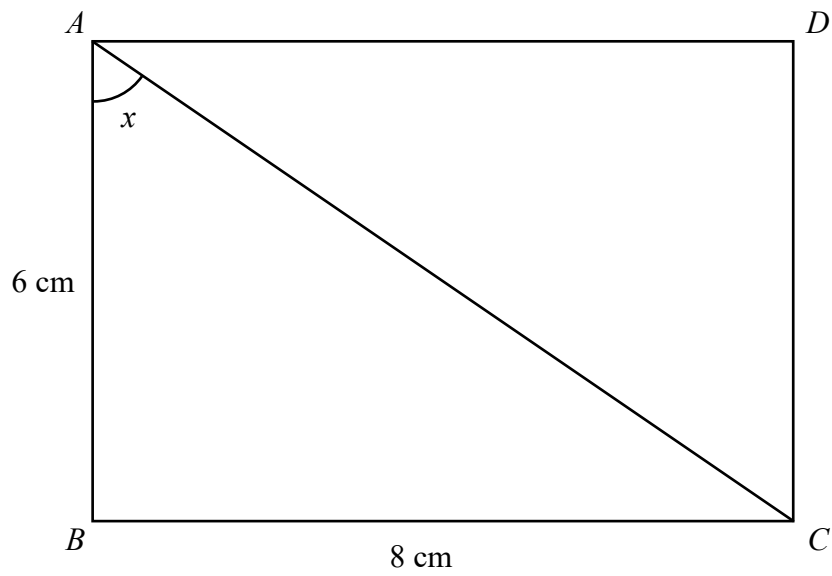


Diagram not drawn to scale

(a) Find the value of angle x . Give your answer to 2 decimal places.

.....^o
(2)

(b) Work out the length of diagonal AC .

..... cm
(1)

The length of the side AB is increased by 2 cm.
The length of side BC remains as 8 cm.

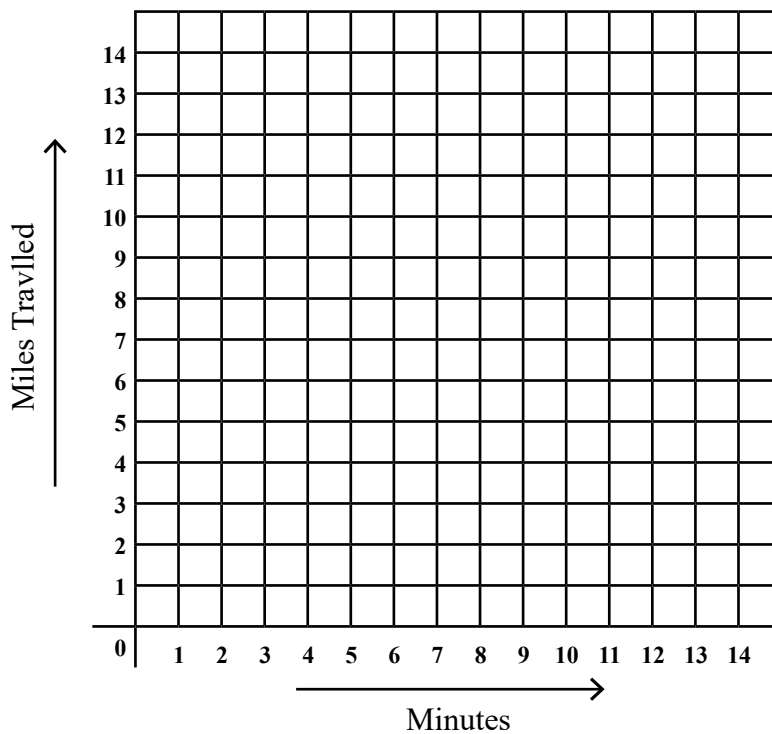
(c) Does the value of $\tan(x)$ increase or decrease? Give a reason for your answer.

.....

(2)

(Total for Question 6 is 5 marks)

7 Fred drives 8 miles in 6 minutes and then halts for 2 minutes. He then drives straight for the next 3 minutes, with the same speed.



(i) Draw a graph representing the above information.

(2)

(ii) From the graph calculate the speed at which Fred travels in mph.

.....

(2)

(Total for Question 7 is 4 marks)

8 Expand and simplify $(x + 4)(x - 3)$

.....

(Total for Question 8 is 2 marks)

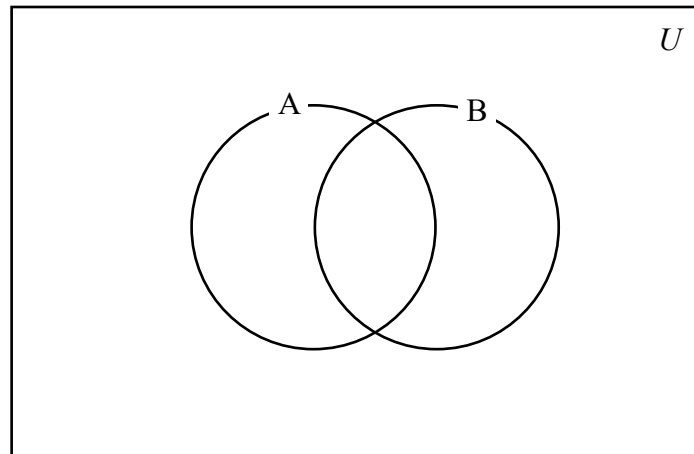
9 Olivia has to choose which places she wants to go for a picnic.

Group A	Group B
Hyde Park	Bigben
London Eye	Loch Ness
Canterbury	Stonehenge

She can choose one from group A and one from group B.
Write down all the possible combinations Olivia can choose.

(Total for Question 9 is 2 marks)

- 10** U = Set of Natural Numbers from 1 to 20
 A = Set of Even Numbers from 1 to 20
 B = Set of Prime Numbers from 1 to 20



(a) Complete the Venn diagram to represent this information.

(2)

A number is chosen at random from a universal set U .

(b) Find the probability that the number is in the set $A \cap B$.

.....
(3)

(Total for Question 10 is 5 marks)

11 Length (L) of an object in metres varies according to the temperature (T) in Celsius as : $L = L_0 + 0.02T$

(a) Make T the subject of the formula $L = L_0 + 0.02T$

.....

(2)

(b) Work out the value of T when $L = 2.2$ m and $L_0 = 2.0$ m

..... °C

(2)

(Total for Question 11 is 4 marks)

12 (a) Calculate $(6.5 \times 10^{10}) - (4.5 \times 10^9)$

.....

(2)

(b) Write the following numbers in order
Start with the smallest number.

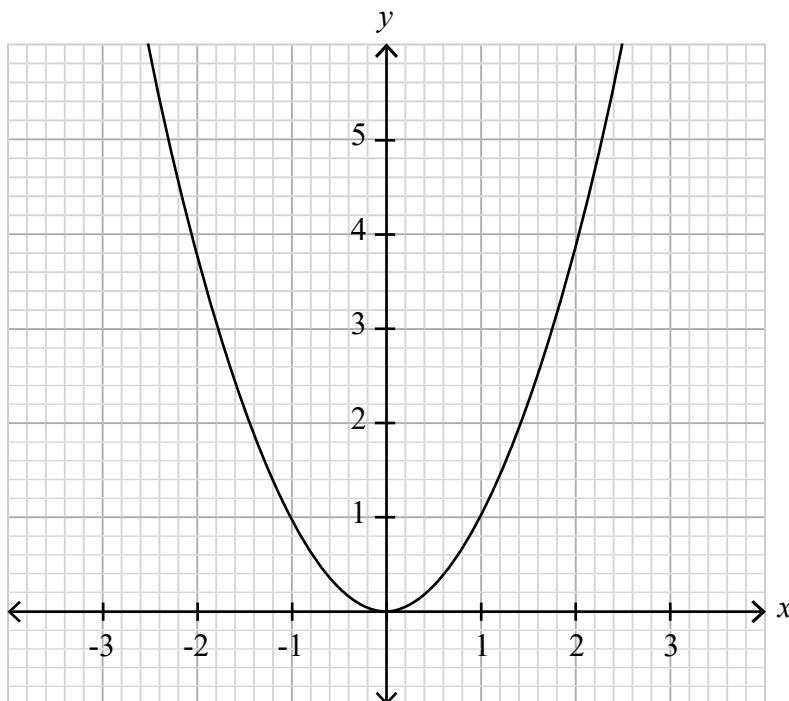
1.5×10^5 5.5×10^4 65×10^4 105×10^2 8.5×10^5

.....

(2)

(Total for Question 12 is 4 marks)

13 Graph of $y = x^2$ is drawn on the grid.



(a) On the same grid, draw the line $y = x + 2$ for x from -3 to 3 .

(2)

(b) Using the graph, find the coordinates of the points where line $y = x + 2$ meets with $y = x^2$.

.....

(1)

(Total for Question 13 is 3 marks)

14 Convert 21.45 feet to inches, if 3 feet is 36 inches.

..... inches

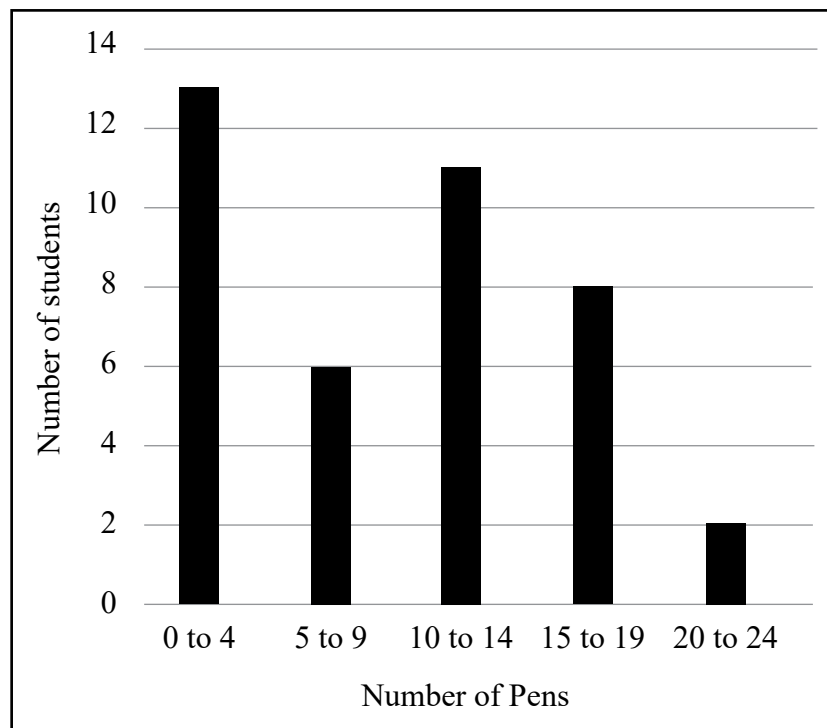
(Total for Question 14 is 1 mark)

15 The ratio of measures of an exterior and interior angle of a regular polygon is 4:1. Find the number of sides of the regular polygon.

.....

(Total for Question 15 is 2 marks)

16 Jim asked 40 students how many pens they had bought last year. The chart below shows the response of those 40 students.



(a) Work out the percentage of students who bought 15 or more pens in the last year.

..... %

(2)

(b) Show that the estimate for the mean number of pens bought is 9.5. You must show all your work.

(3)

(Total for Question 16 is 5 marks)

17 Find the reciprocal of 1.25

.....

(Total for Question 17 is 1 mark)

18 (a) Estimate the value of: $\frac{18.54 \times 13.1}{0.475}$

.....

(2)

(b) Paul buys 23 kg of flour at a cost of £1.6 per kg. Estimate the total cost.

£

(2)

(Total for Question 18 is 4 marks)

19 (a) The attendance at a Hockey game was 3459 people. Round this off to the nearest hundred.

.....

(1)

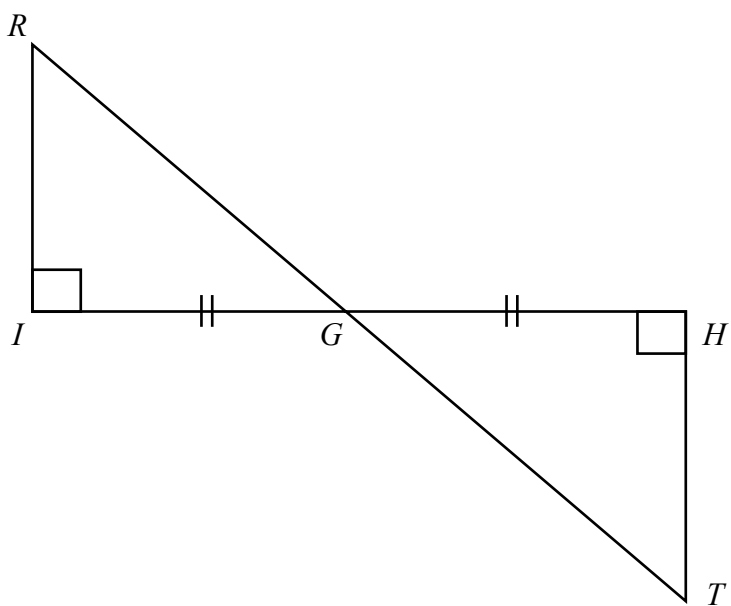
(b) Round 1284.5 to 2 significant figures.

.....

(1)

(Total for Question 19 is 2 marks)

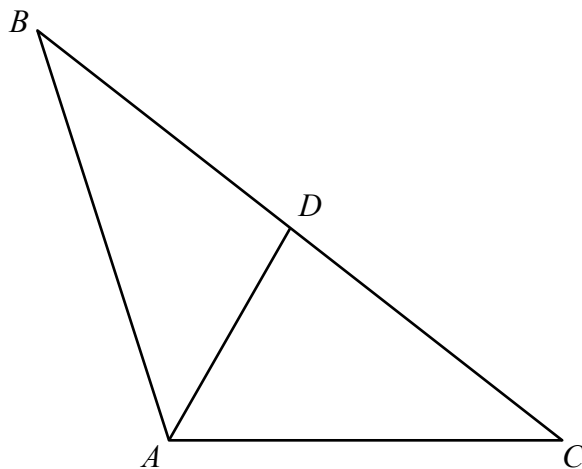
- 20 (a) From the figure shown below, prove that triangle RIG and triangle THG are congruent to each other.



Give reasons at each stage of your working.

(2)

(b) In the figure shown below, AD is the bisector of BC and angle ABD is not equal to angle DCA , angle BAD is not equal to angle CAD .



If by SAS rule, triangle ADB is congruent to triangle ADC , then prove that AD is the perpendicular bisector of BC .

(3)

(Total for Question 20 is 5 marks)

21 The table shows information about the number of points scored by 40 students in a competition.

Number of points	Frequency
0	5
1	2
2	10
3	6
4	8
5	4

(a) Find the modal number of points

.....

(1)

(b) Work out the total number of points scored.

.....

(2)

(Total for Question 21 is 3 marks)

22 Solve: $\frac{5x + 5}{1 - x} = 8$

.....

(Total for Question 22 is 3 marks)

23 The first three terms of a sequence are 4, 8 and 16.

(a) Find the 5th term in the sequence.

.....

(1)

(b) Write down the expression for the nth term of the sequence.

.....

(2)

(Total for Question 23 is 3 marks)

24 The gravitational force, F , between two objects is inversely proportional to the square of the distance, x , between them. If $x = 20$ m and $F = 1200$ N, form an equation connecting F and x and use it to find the value of F when $x = 50$ m.

..... N

(Total for Question 24 is 3 marks)

25 Elena has baked 60 cookies.

20% of the cookies are plain.

$\frac{1}{4}$ of the cookies are chocolate.

0.3 of the cookies are blueberry. The rest are orange.

How many cookies are orange?

..... cookies

(Total for Question 25 is 2 marks)

26 In a shop, there is a collection of x blue marbles and y green marbles.

After selling 3 blue and 3 green marbles, the ratio of blue to green marbles is 2 : 3.

After restocking the collection with 5 blue and 5 green marbles, the ratio becomes 3 : 4.

Find the values of x and y .

.....
(Total for Question 26 is 5 marks)

27 (a) Express 0.68 as a fraction in the simplest form.

.....

(1)

(b) Write $\frac{7}{20}$ as a decimal.

.....

(1)

(Total for Question 27 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS