

Please check the examination details below before entering your candidate information

Candidate surname		Other names	
Centre Number		Candidate Number	
Pi Academy Level 1/Level 2 GCSE (9–1)			
Tuesday 21 May 2019			
Morning (Time: 1 hour 30 minutes)			
Mathematics Paper 1 (Non-Calculator) Foundation Tier			
You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. 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 not be used.**



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 Simplify $\frac{5x^2 - 19x + 18}{x^2 - 4}$

.....

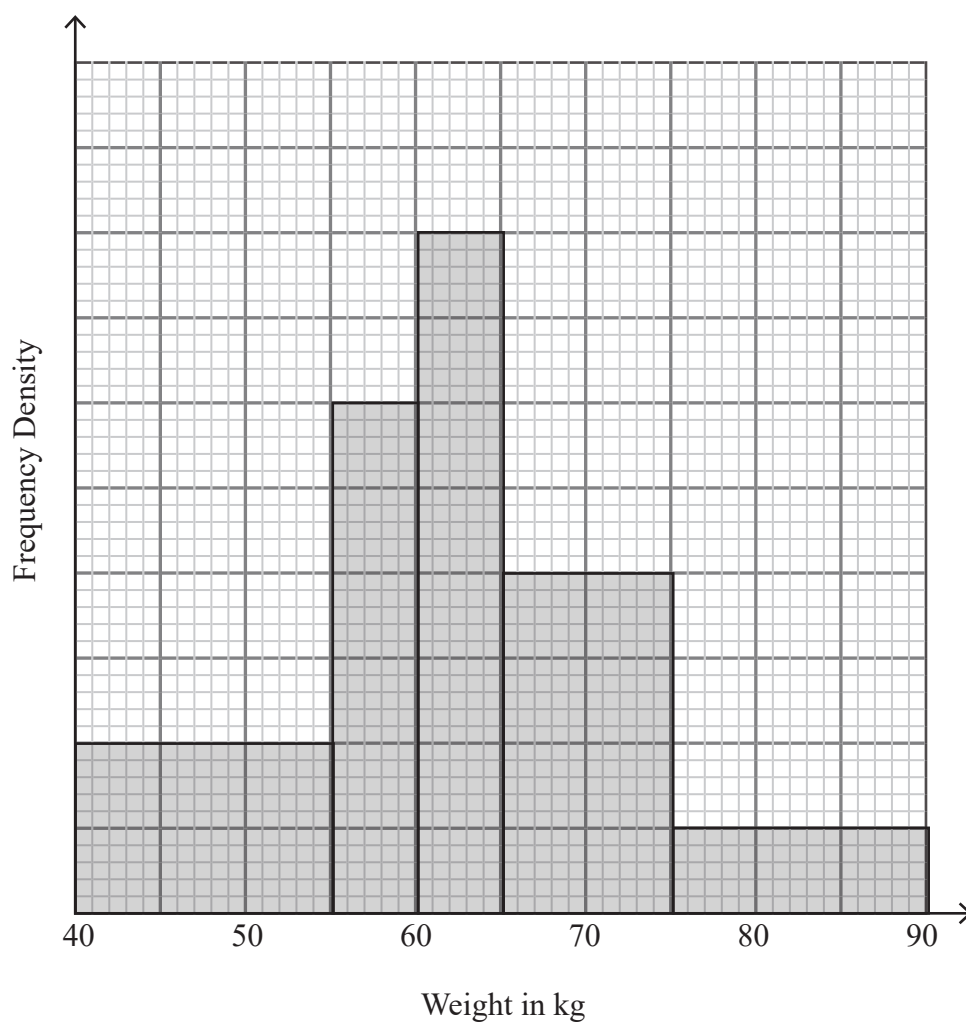
(Total for Question 1 is 3 marks)

- 2** If the probability of getting a green counter is $1 - 2y$, find the probability of getting any counter except green.

.....

(Total for Question 2 is 1 mark)

- 3 The Histogram shows some information about the weights of members of a sports club.



30 members weigh between 75kg and 90kg.

30% of the members of the sports club who are over 60kg are female.

Work out an estimate for the number of female members who weigh more than 60kg.

.....

(Total for Question 3 is 5 marks)

- 4 (a) Write down the value of $\frac{1}{5} + \frac{2}{6}$
Give the fraction in its simplest form.

.....

(1)

- (b) Work out $6\frac{3}{4} \div 5\frac{2}{5}$

.....

(2)

(Total for Question 4 is 3 marks)

5 Jacob says,

“The sum of the squares of two consecutive numbers is always even.”

Is Jacob correct? Explain your answer.

(Total for Question 5 is 3 marks)

6 Jolly used her calculator to work out the value of a number z .

The answer on her calculator began

9.04

Write down the error interval for z .

..... $\leq z <$

(Total for Question 6 is 2 marks)

7 Ronney makes 75 litres of Brown paint by mixing litres of Red paint and litres of Black paint in the ratio 4:1

Red paint is sold in 15-litre tins.

Each tin of red paint costs £30

Black paint is sold in 5 litres tins.

Each tin of black paint costs £50

Ronney sells all the Brown paint he makes in 10 litres tins.

He sells each tin of Brown paint for £70

Work out Ronney's percentage profit on each tin of Brown paint he sells.

Give your answer to the nearest whole number.

..... %

(Total for Question 7 is 3 marks)

8 (a) Write 23300000 in standard form.

.....

(1)

(b) Write 1.41×10^{-4} as an ordinary number.

.....

(1)

(Total for Question 8 is 2 marks)

- 3x add onespace after minus sign

9 The graphs of $x^2 - 3x + y = 0$ and $2x + y = 4$ intersect at two points.

Work out the possible coordinates of those two points.

(....., ...) and (....., ...)

(Total for Question 9 is 4 marks)

10 There are 12 fruits in a bag.

3 of the fruits are red.

4 of the fruits are blue.

5 of the fruits are green.

Marry takes two fruits and are taken at random from the bag.

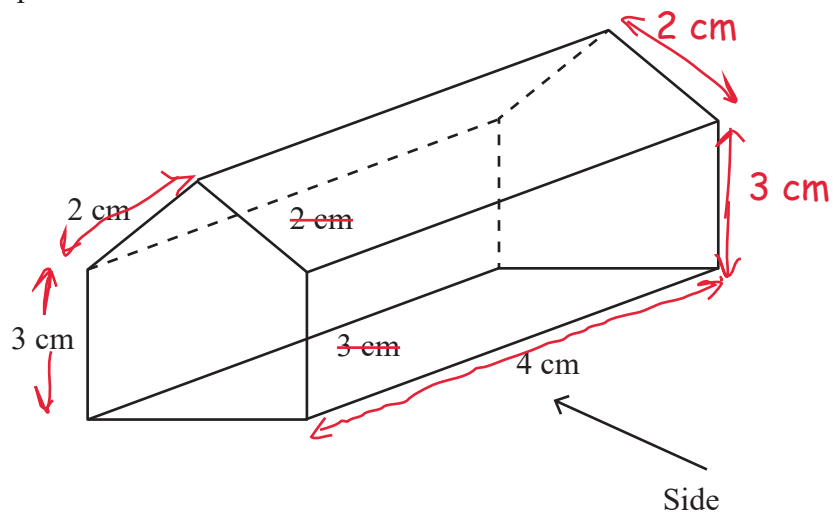
Work out the probability that both of the fruits Marry takes are the same colour.

You must show your working.

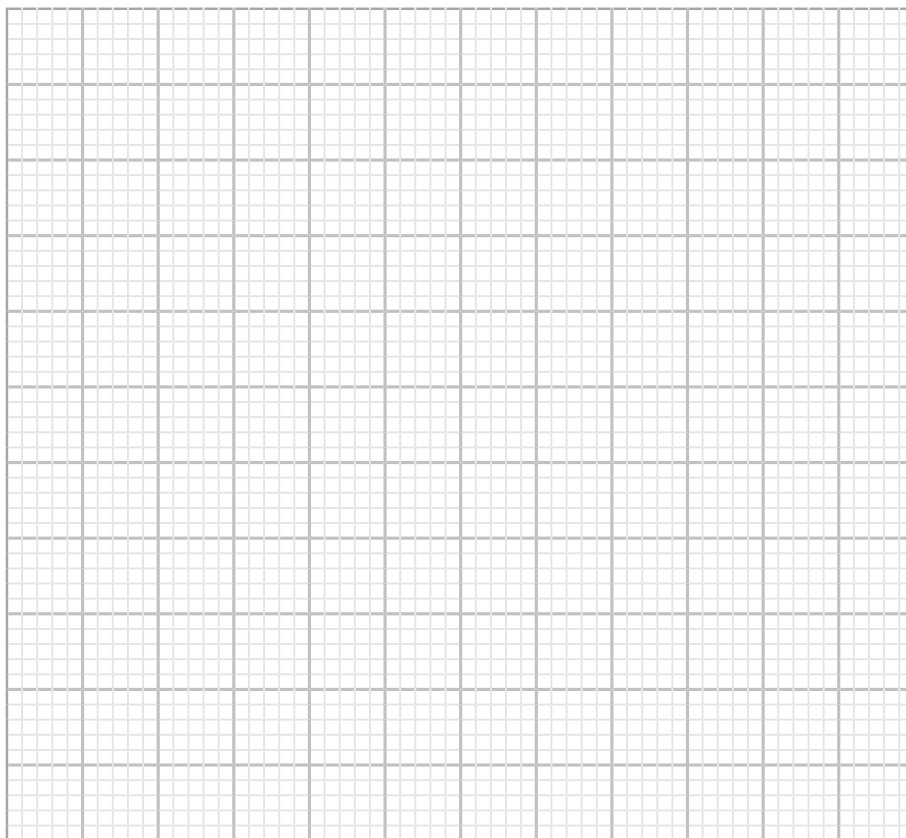
.....

(Total for Question 10 is 4 marks)

11 The diagram shows a prism of a solid.



On the centimetre grid below, draw the plan elevation and the side elevation of the prism.



(Total for Question 11 is 3 marks)

12 X and Y are two numbers such that $X > Y$ *x is grater than y*

When you add 4 to X and add 4 to Y, the ratio is 11:7

When you subtract 1 from X and subtract 1 from Y, the ratio is 3:1

italic x and y

Find the ratio X:Y

Give your answer in its simplest form.

..... :

(Total for Question 12 is 5 marks)

13 (a) Write down the exact value of $\cos(0^\circ)$

.....

(1)

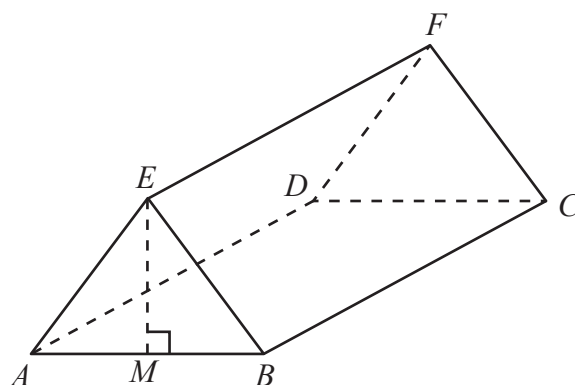
(b) Rectangle $ABCD$ is the horizontal base of a triangular prism $ABCDEF$.

~~$ABCDEF$.~~

$AE = BE$

E is vertically above M , the midpoint of AB .

$AB = 10 \text{ cm}$ $AE = 13 \text{ cm}$ $BC = 25 \text{ cm}$



Work out the size of angle MEC .

Give your answer correct to the nearest degree.

.....°

(4)

(Total for Question 13 is 5 marks)

14 A straight line, P , passes through points $A(0, a)$ and $B(7, -5)$ and is perpendicular to the line $7x - 3y = 2$.

(a) Find the equation of the line P .

.....

(2)

(b) Work out the coordinates of Point A .

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

(1)

(c) Point M lies on line segment AB such that $AM:MB = 4:3$
What are the coordinates of M ?

.....

(3)

(Total for Question 14 is 6 marks)

15 At time $t = 0$ hours a container is full of liquid.

Liquid leaks from the container.

At the end of every hour, there is 5% less liquid in the container than at the start of the hour.

The volume of liquid, in litres, in the container at time t hours is V_t

Given that

$$V_0 = 4000$$

$$V_{t+1} = k V_t$$

Write down the value of k .

.....

(Total for Question 15 is 3 marks)

16 If $f(x) = x^2 - 20$ and $g(x) = 4x$, find $fg(-1) - g(-1)$.

.....

(3)

(Total for Question 16 is 3 marks)

17 Find the equation of a tangent to the circle $x^2 + y^2 = 169$ at the point $(-5, 12)$.

.....

(Total for Question 17 is 3 marks)

18 Show algebraically $0.\dot{2}\dot{3} \times 0.\dot{2} = \frac{46}{891}$

(3)

(Total for Question 18 is 3 marks)

- 19** A bank has two types of accounts.
Both accounts pay compound interest.

Type 1	Type 2
Savings Account Interest 3.5% per annum	Shares Account Interest 4.5% per annum

Andrew invests £4000 in the savings account.
Bruke invests £3500 in the shares account.

- (a) Work out who will get the most interest by the end of 4 years and by how much?
You must show all your working.

.....
(4)

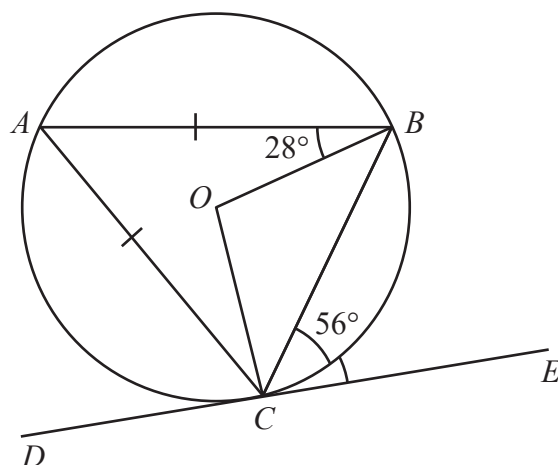
In the 4th year, the rate of interest for the shares account is changed to 5% per annum.

- (b) Does this affect who will get the most interest by the end of 4 years? Give a reason for your answer.

.....
.....
.....

(1)

(Total for Question 19 is 5 marks)



(a) A , B and C are points on the circumference of a circle, centre O .

DCE is a tangent to the circle.

$AB = AC$

Angle $BCE = 56^\circ$

Angle $ABO = 28^\circ$

Find the size of angle OCB .

Give reasons for each stage of your working.

.....^o

(2)

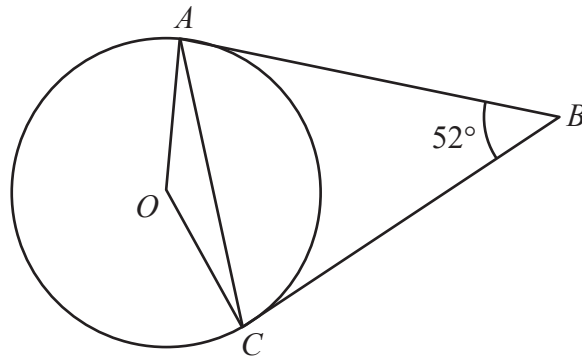
(b) A and C are points on the circumference of a circle, centre O .

AB and BC are tangents to the circle.

Angle $ABC = 52^\circ$

Find the size of angle OAC .

Give reasons for each stage of your working.

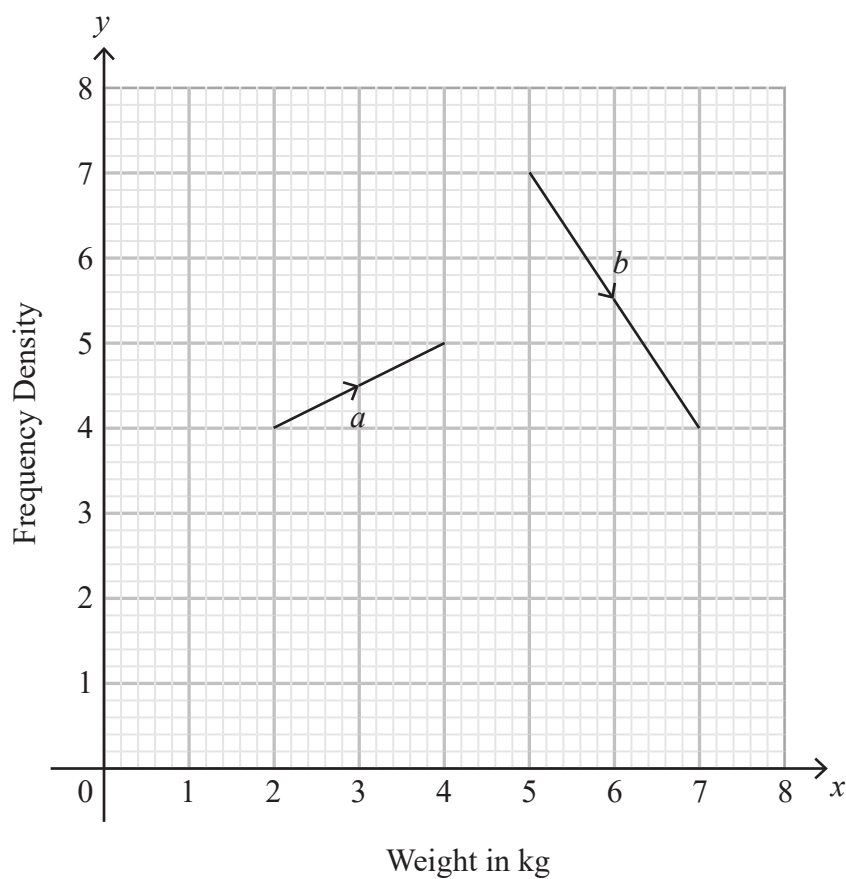


..... °

(2)

(Total for Question 20 is 4 marks)

21 The vector a and the vector b are shown on the grid.



(a) On the grid, draw and label vector $-3a$

(1)

(b) Work out $-2a - 3b$ as a column vector.

(2)

(Total for Question 21 is 3 marks)

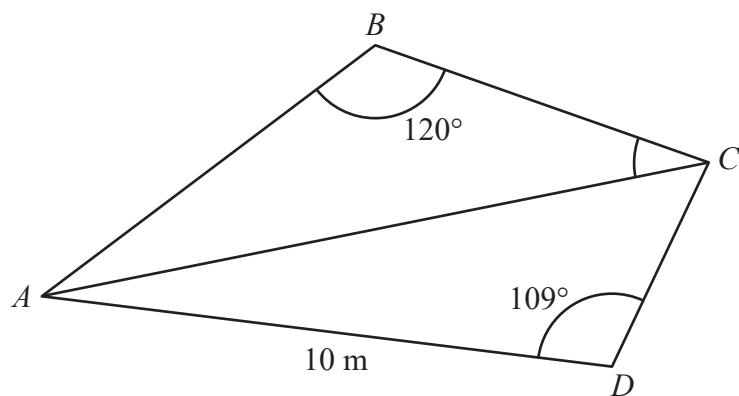
22 Find an expression for the n th term of the sequence

3 18 41 72

.....

(Total for Question 22 is 3 marks)

23 ABC and ADC are triangles.



The area of the triangle ADC is 37 cm^2

Work out the length of AB .

Give your answer correct to 1 decimal place.

.....
(Total for Question 23 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS