

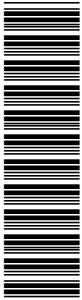
GCSE (9–1) Mathematics

J560/03 Paper 3 (Foundation Tier)

Practice Paper

Date – Morning/Afternoon

Time allowed: 1 hour 30 minutes



You may use:

- A scientific or graphical calculator
- Geometrical instruments
- Tracing paper



First name

Last name

Centre
number

Candidate
number

INSTRUCTIONS

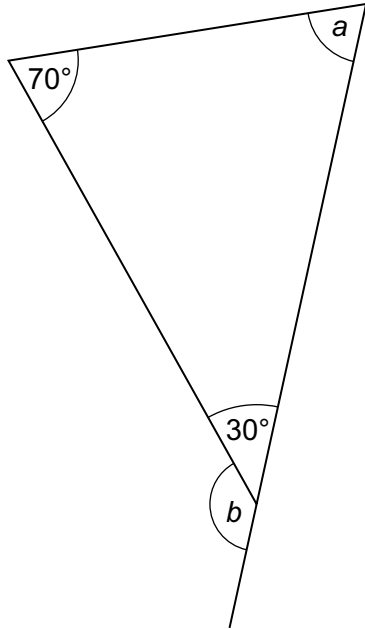
- Use black ink. You may use an HB pencil for graphs and diagrams.
- Complete the boxes above with your name, centre number and candidate number.
- Answer **all** the questions.
- Read each question carefully before you start your answer.
- Where appropriate, your answers should be supported with working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided.
- Additional paper may be used if required but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

INFORMATION

- The total mark for this paper is **100**.
- The marks for each question are shown in brackets [].
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
- This document consists of **20** pages.

Answer **all** the questions

1 Here is a diagram.



Not to scale

(a) Work out angle a .

(a) $a = \dots\dots\dots^\circ$ [1]

(b) Work out angle b .

(b) $b = \dots\dots\dots^\circ$ [1]

2 (a) Write down a number between 1.56 and 1.57.

(a) [1]

(b) Write down a prime number between 14 and 22.

(b) [1]

(c) Find a fraction between $\frac{1}{4}$ and $\frac{1}{3}$.

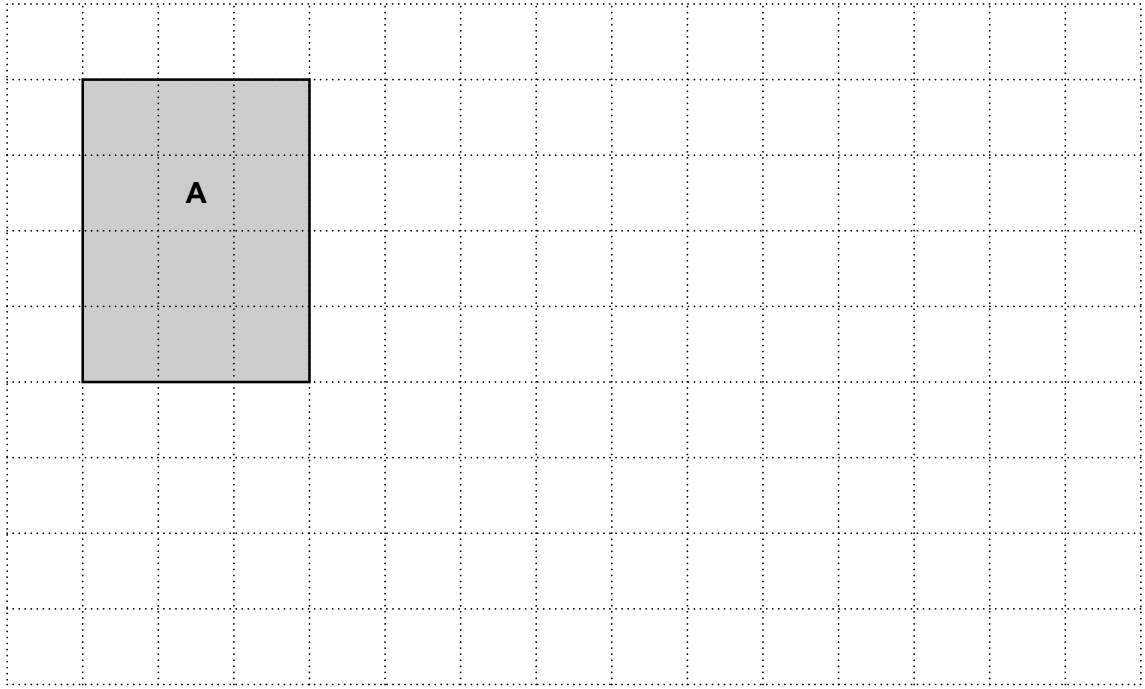
(c) [2]

- 3 (a) (i) Draw a rectangle that is congruent to rectangle **A**.
Label it **B**.

[1]

- (ii) Draw a rectangle that has the same perimeter as rectangle **A**, but a different area.
Label it **C**.

[2]



- (b) Draw an isosceles triangle with area 8 cm^2 on the grid below.



[2]

- 4 (a) Ken has a bag containing counters.
2 are white, 3 are black and 4 are red.
He takes one of these counters at random.

What is the probability that the counter is white?

(a) [2]

- (b) Abi has a bag containing black counters and white counters.
The ratio of black to white counters is 1 : 2.
Abi takes one of these counters at random.

What is the probability that it is black?

(b) [1]

- (c) Jemma has a bag containing 24 balls.

- (i) The probability that a ball taken from the bag at random is green is $\frac{1}{3}$.

How many of the 24 balls are green?

(c)(i) [2]

- (ii) 12 of the 24 balls are blue.
Jemma takes a ball from the bag at random and then puts it back.
She then takes a ball again at random.

What is the probability that **both** balls are blue?

(ii) [2]

- 5 Amy is making a rectangular quilt by sewing together squares of fabric.

Each square is 12 cm by 12 cm.

The finished quilt must be at least 1.5 m wide and at least 2.1 m long.

- (a) What is the smallest number of squares that Amy can use?
Show how you decide.

(a) squares [5]

- (b) The area of the finished quilt is about 3.4 m^2 .
Amy says

3.4 m^2 is the same as 340 cm^2 .

Show that Amy is wrong.

[3]

6 (a) Show that the highest common factor of 12 and 30 is 6.

[2]

(b) Show that 77 is **not** a square number.

[2]

7 Helen needs to buy 6 packs of tea.
This table shows the offers available in two shops.

Shop	Offer
A	3 for the price of 2
B	Buy one, get one half price

A single pack of tea costs the same in each shop.

Which shop is cheaper for Helen?
Explain how you decide.

.....
..... [3]

- 8 Hardeep asks 25 people how many portions of fruit and vegetables they ate yesterday. The results are shown in this table.

Number of portions	Frequency	
4	4	
5	6	
6	8	
7	5	
8	2	

- (a) Calculate the mean number of portions.

(a) [3]

- (b) Hardeep ate no portions of fruit and vegetables yesterday. He decides to include this in his results.

Explain how this will affect

- (i) the mode,

.....
 [1]

- (ii) the range.

.....
 [1]

9 (a) Evaluate.

$$\frac{3}{0.4^2}$$

(a) [1]

(b) Find p if $p^3 = 37$.
Give your answer correct to 2 decimal places.

(b) [2]

(c) Find the value of $a - b$ when $a = 3$ and $b = -2$.

(c) [1]

10 (a) Look at this table.

Odd numbers	Total
1	1^2
$1 + 3$	2^2
$1 + 3 + 5$	3^2

The pattern in the table continues.

(i) Complete the next row of the table.

[1]

(ii) What will be written in the Total column of the 100th row?

(a)(ii) [1]

(b) Here is another table.

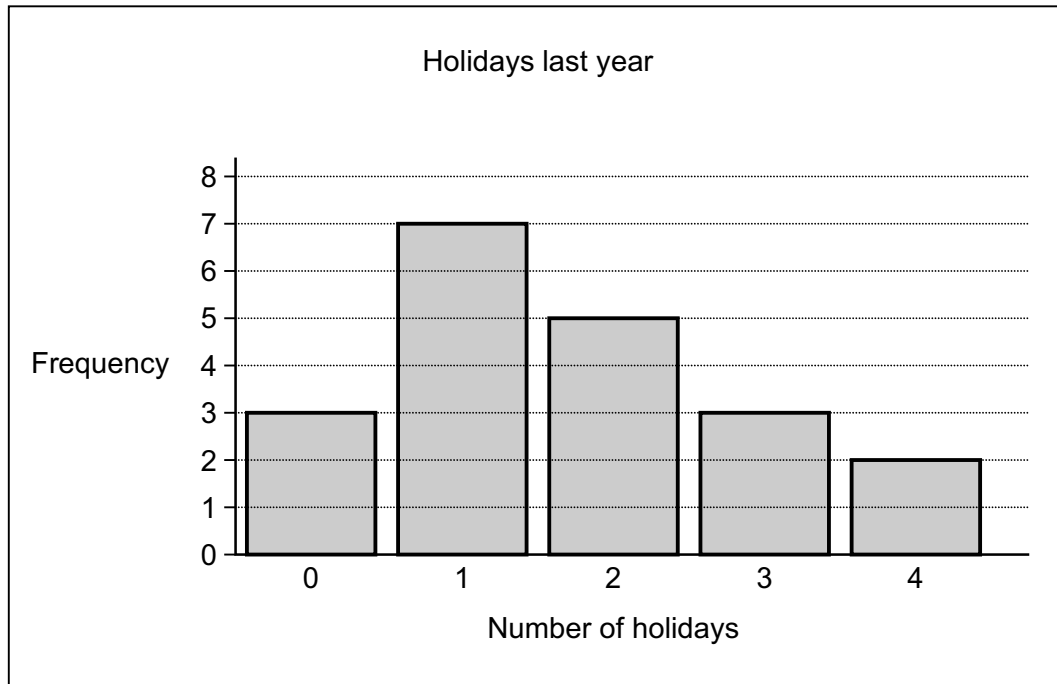
Even numbers	Total
2	$1^2 + 1$
$2 + 4$	$2^2 + 2$
$2 + 4 + 6$	$3^2 + 3$
$2 + 4 + 6 + 8$	$4^2 + 4$

The pattern in this table continues.

Write an expression for the total of the first n even numbers.

(b) [2]

- 11 Noelle asks her friends how many holidays they had last year. Her results are shown in this bar chart.



- (a) Show that Noelle asked 20 friends.

[1]

- (b) Find the median number of holidays.

(b) [2]

- (c) Noelle says

Based on my sample, I estimate 10% of people in the UK had 4 holidays last year.

Give two reasons why Noelle should **not** base this estimate on her sample.

Reason 1.....

Reason 2.....
 [2]

12 (a) Solve.

$$3a + 10 = a + 40$$

(a) $a = \dots\dots\dots$ [3]

(b) Factorise.

$$x^2 - 2x - 8$$

(b) $\dots\dots\dots$ [2]

13 A sequence is generated using the rule

- multiply the previous term by 2
- then subtract 30.

The first term of the sequence is 40.

(a) Find the second term.

(a) $\dots\dots\dots$ [2]

(b) Find the fourth term.

(b) $\dots\dots\dots$ [2]

14 (a) Paul invests £500 at a rate of 1.5% per year **compound** interest.

Find the value of the investment after 3 years.
Give your answer correct to the nearest penny.

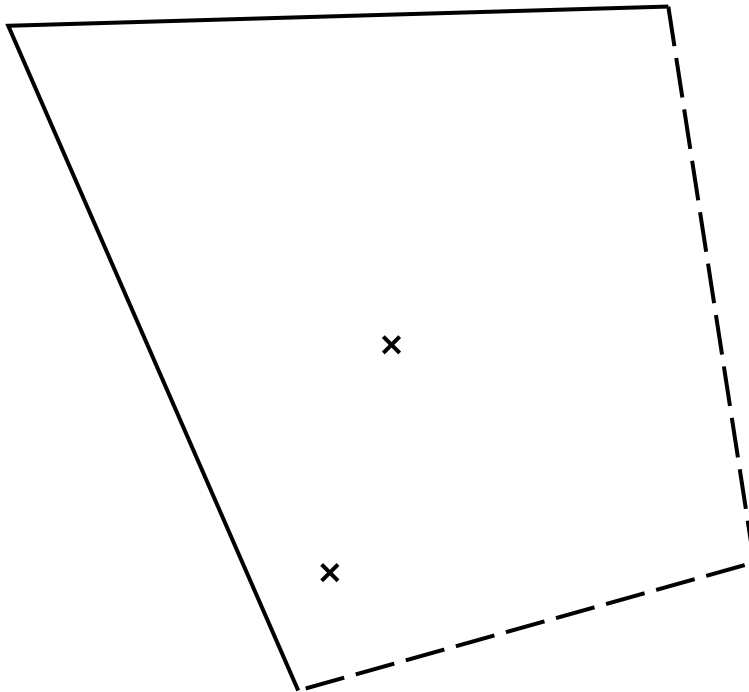
(a) £ [4]

(b) By what percentage has the value of Paul's investment increased after 3 years?

(b) % [3]

- 15 Jez finds a gold coin in a field.
This is a scale drawing of the field.

Scale: 1 cm represents 50 m



Key	
x	Tree
---	Wall
—	Hedge

Jez says that the coin was

- an equal distance from each hedge
- an equal distance from each tree.

Show by construction that Jez is wrong.

[5]

16 A triangle has sides of length 23.8 cm, 31.2 cm and 39.6 cm.

Is this a right-angled triangle?
Show how you decide.

.....
..... [4]

17 John is going to drive from Cambridge to Newcastle.



- (a) John needs to be in Newcastle at 11 am.
He drives at an average speed of 60 miles per hour.

What time does he need to leave Cambridge?

(a) [5]

(b) State one assumption you have made.
Explain how this has affected your answer to part **(a)**.

.....

.....

.....

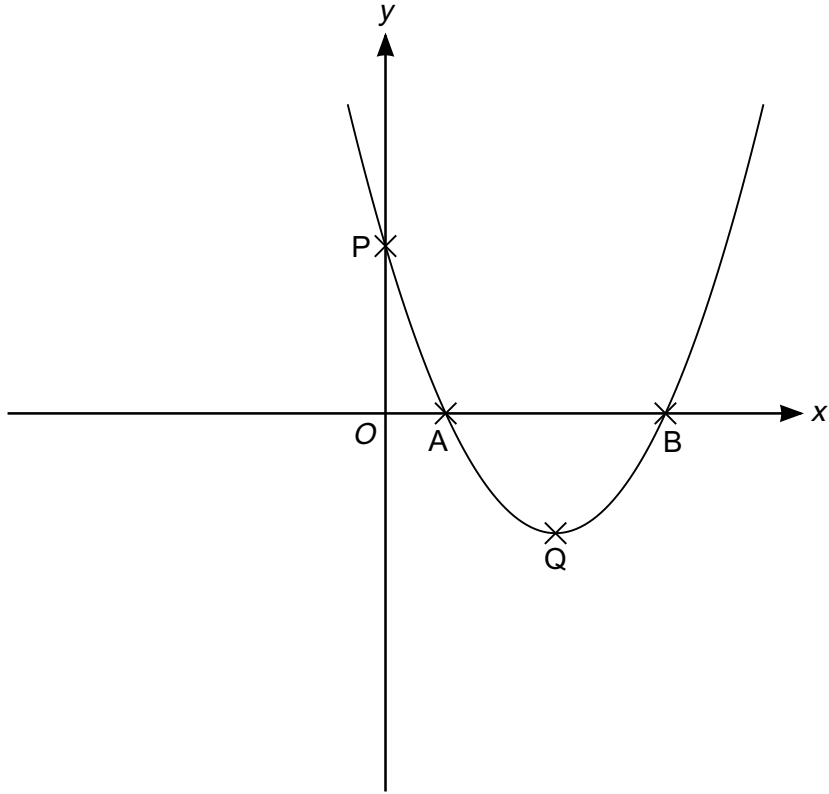
..... **[2]**

18 When water freezes into ice its volume increases by 9%.

What volume of water freezes to make 1962 cm^3 of ice?

..... cm^3 **[3]**

19 This is a sketch of the graph of $y = (x - 1)(x - 3)$.



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

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

B (..... ,) [2]

(b) Work out the coordinates of point P.

(b) P (..... ,) [2]

(c) Work out the coordinates of the turning point Q.

(c) Q (..... ,) [3]

TURN OVER FOR QUESTION 20

- 20** The table shows data for the UK about its population and the total amount of money spent on healthcare in 2002, 2007 and 2012.

Year	Population	Total spent on healthcare (£)
2002	5.94×10^7	8.14×10^{10}
2007	6.13×10^7	1.20×10^{11}
2012	6.37×10^7	1.45×10^{11}

- (a)** How much more was spent on healthcare in 2007 than in 2002?
Give your answer in millions of pounds.

(a) £ million **[3]**

- (b)** Marcia says

The amount spent on healthcare **per person** in the UK doubled in 10 years.

Use the information in the table to comment on whether Marcia is correct.

.....
..... **[4]**

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