



THIRD SPACE
LEARNING

Mathematics

Paper 1

(Non-Calculator)

Higher Tier

Edexcel GCSE

SET 1B

Mathematics Paper 1 (Non-Calculator) Higher Tier Edexcel

GCSE SET 1B

Name

Total marks



Paper length: 1hr 30mins

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.

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

This practice paper is based on the topics from the **advanced information for the November 2022 exam series**.

Please note, this practice paper is an example to help revision, these topics can be tested in other ways and other topics may be included in the actual papers

- 1 (a) Simplify $a^3 \times a^5$

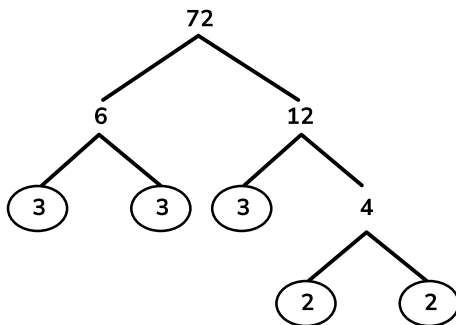
(1)

- (b) Simplify $(3c^2)^4$

(2)

(Total for Question 1 is 3 marks)

- 2 Ben wants to write 72 as a product of its prime factors. He draws a prime factor tree:



- (a) What mistake has Ben made?

(1)

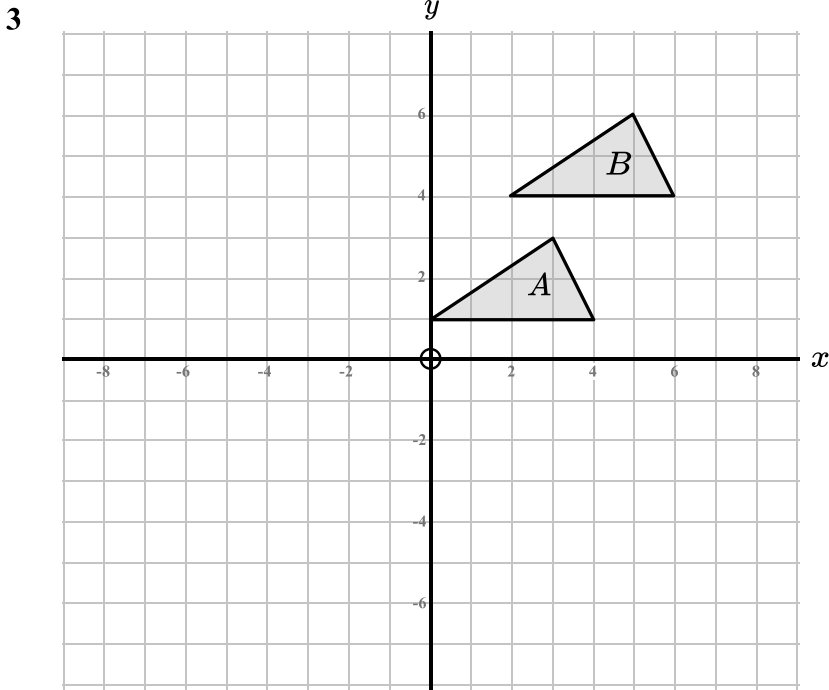
- (b) Write the correct answer in index form.

(1)

- (c) Find the highest common factor of 72 and 90.

(3)

(Total for Question 2 is 5 marks)



(a) A transformation is applied to shape A. The image is shape B.

Ann says

‘Shape A has been translated by the vector $\begin{pmatrix} 3 \\ 1 \end{pmatrix}$.’

Is Ann correct? Explain your answer.

(2)

(b) Rotate shape B 90° clockwise about the origin.

(2)

(Total for Question 3 is 4 marks)

- 4 (a) Katrina is baking a cake. For the sponge she needs $1\frac{1}{2}$ cups of butter and for the butter icing she needs $\frac{1}{3}$ cup of butter. How much butter does Katrina need in total for her cake?

(2)

- (b) Katrina's recipe will serve 12 people. Katrina needs to make enough cake to serve 30 people. How much butter will Katrin need? Give your answer as a mixed number.

(3)

(Total for Question 4 is 5 marks)

- 5 A travel company recorded the holiday duration of a random sample of 80 customers.

Holiday duration	Frequency
1 - 3 nights	17
4 - 6 nights	28
7 - 9 night	23
10+ nights	12

- (a) Over the summer, the travel company had 7200 customers.
Any customer who booked a holiday of 10 nights or longer received a discount of 10%.
Estimate the number of customers who received this discount over the summer.

(3)

- (b) Explain why this is only an estimate.

(1)

(Total for Question 5 is 4 marks)

- 6 In a school the ratio of male teachers:female teachers is 1:4.

30% of the male teachers are maths teachers.

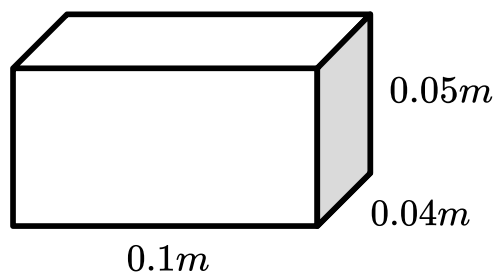
10% of the female teachers are maths teachers.

Show that the ratio of maths teachers:other teachers is 7:43.

(Total for Question 6 is 5 marks)

- 7 For this question you may use $Pressure = \frac{Force}{Area}$.

Here is a box.



- (a) Calculate the area of the base of the box.

State the units for your answer.

(2)

- (b) The box is on a table. The pressure on the table is 8000N/m^2 .

Work out the value of the force exerted on the table.

N

(3)

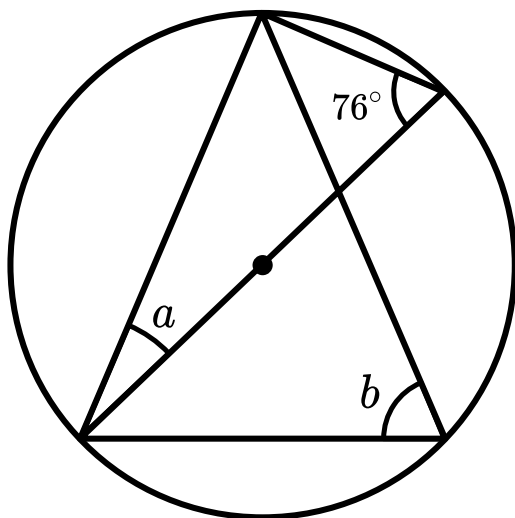
(Total for Question 7 is 6 marks)

- 8 The first six terms of a geometric sequence are: 1, 3, 9, 27, 81, 243, ...

Find the n th term of the sequence.

(Total for Question 8 is 2 marks)

9



- (a) Find the size of angle a .

o

(2)

- (b) Find the size of angle b .

o

(1)

(Total for Question 9 is 3 marks)

10 Solve the equation $x^2 + 5x = 24$

(Total for Question 10 is 3 marks)

11 On Saturdays Alex plays football and Vicky plays hockey. The probability that Alex's team wins is 0.8 and the probability that Vicky's team wins is 0.5.

There are 40 Saturdays throughout the year when both Alex and Vicky's teams play.
Estimate the number of Saturdays that both teams will win.

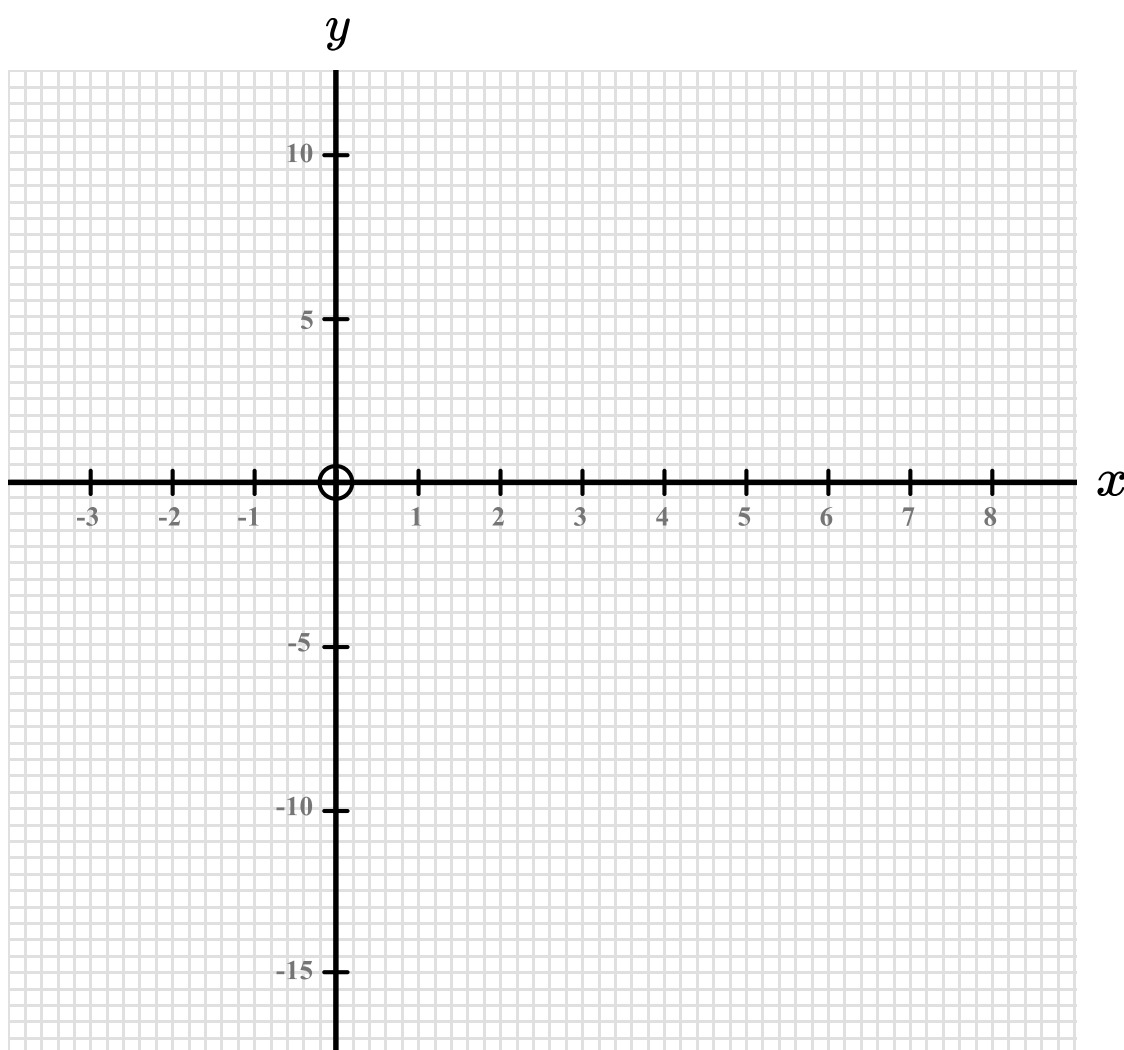
(Total for Question 11 is 3 marks)

12 (a) Complete the table of values for $y = x^3 - 5x^2 + 6$

x	-1	0	1	2	3	4	5
y		6			-12	-10	6

(2)

(b) On the grid plot the graph of $y = x^3 - 5x^2 + 6$ for $-1 \leq x \leq 5$



(2)

(Total for Question 12 is 4 marks)

13 p is inversely proportional to q .

When $p = 10$, $q = 30$.

Find the value of p when $q = 4$.

(Total for Question 13 is 3 marks)

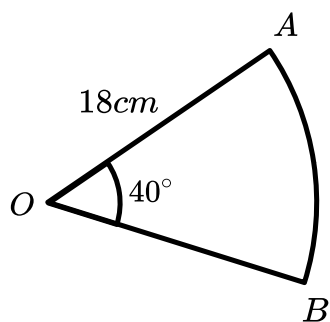
14 Here is a set of cards.



Les picks two cards. What is the probability they are both multiples of 3?

(Total for Question 14 is 3 marks)

15 The diagram shows a sector of a circle



Calculate the length of the arc AB . Give your answer in terms of π .

..... cm

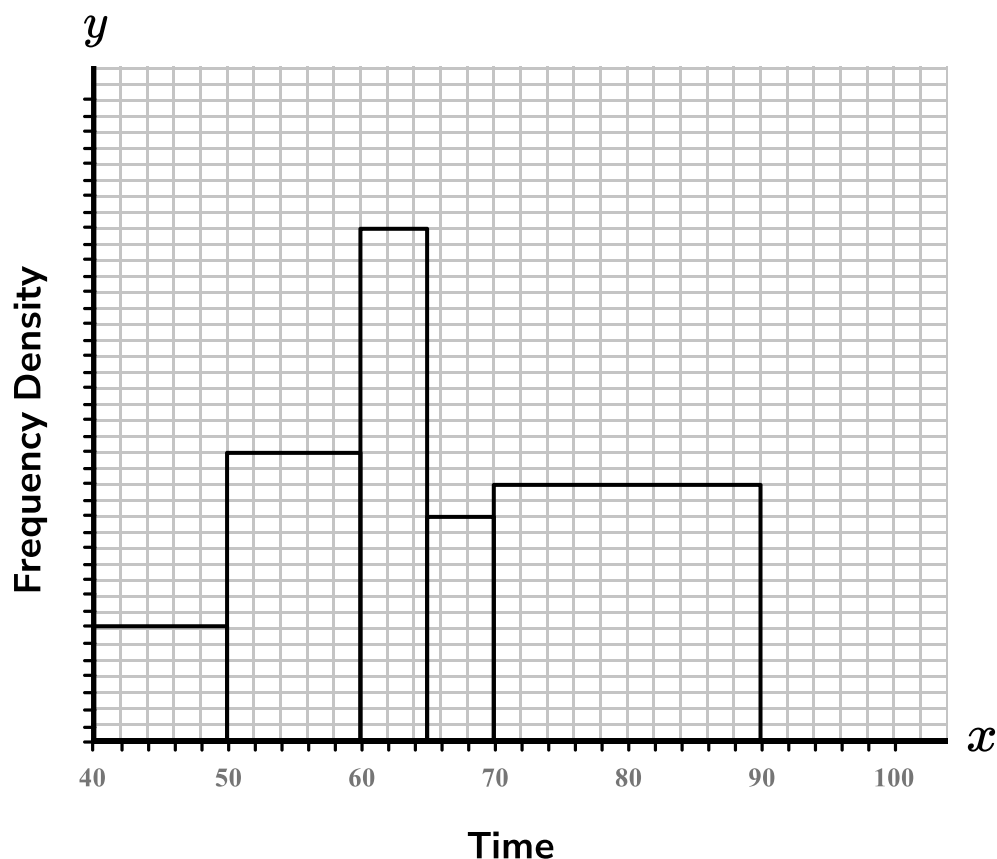
(Total for Question 15 is 2 marks)

16 $2^{\frac{3}{2}} + \sqrt{8} + \sqrt{2}$ can be written in the form $k\sqrt{2}$.

Find the value of k .

.....
(Total for Question 16 is 3 marks)

17 The histogram shows the times taken by a number of runners to finish a 10k race.



(a) 7 runners took less than 50 minutes to finish the race.

How many runners took between 50 and 60 minutes to finish the race?

(2)

(b) Estimate the percentage of runners who took over 80 minutes to finish the race.

(3)

(Total for Question 17 is 5 marks)

18 (a) Show that $\frac{x^2 - 9}{2x^2 - 6x} \equiv \frac{x + 3}{2x}$

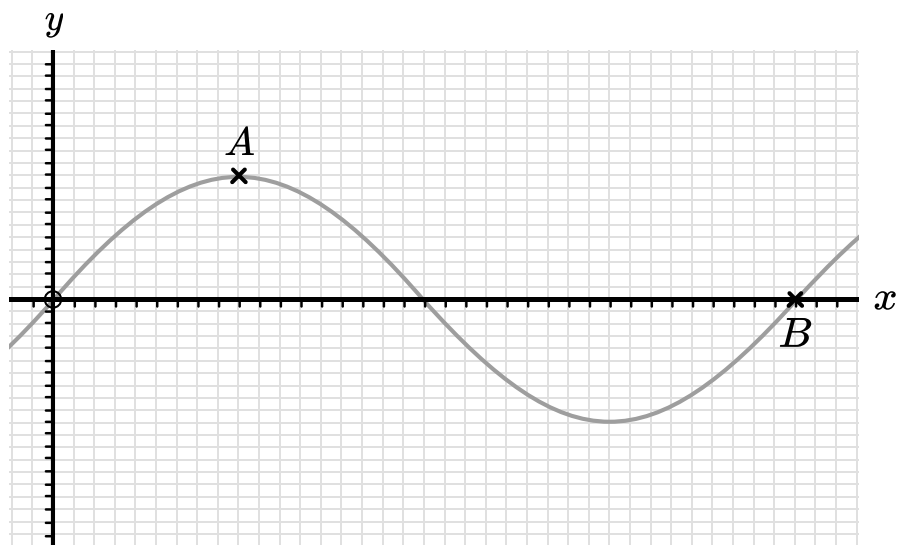
(3)

(b) Hence write $\frac{x^2 - 9}{2x^2 - 6x} + \frac{4x + 2}{3x}$ as a single fraction.

(3)

(Total for Question 18 is 6 marks)

19 Here is the graph of $y = \sin(x)$.



Write down the coordinates of the points A and B.

A: _____

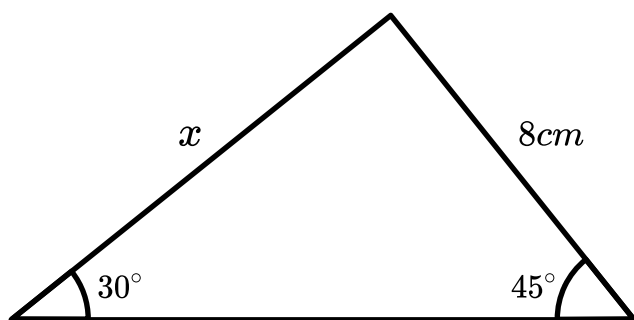
(3)

B: _____

(3)

(Total for Question 19 is 2 marks)

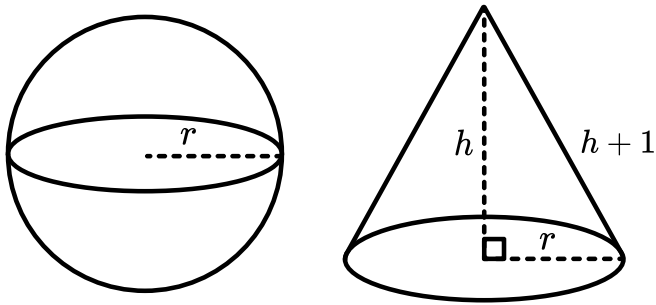
20



Show that $x = 8\sqrt{2}\text{ cm}$.

(Total for Question 20 is 4 marks)

21 This diagram shows a sphere and a cone.



The volume of the sphere is 3 times the volume of the cone.

The surface area of the sphere is 1.5 times the surface area of the cone.

(a) Form two equations in r and h .

(2)

(b) Use your equations to find r and h .

(3)

(Total for Question 21 is 5 marks)

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