



THIRD SPACE
LEARNING

Mathematics

Paper 3

(Calculator)

Higher Tier

Edexcel GCSE

SET 1B

Mathematics Paper 3 (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

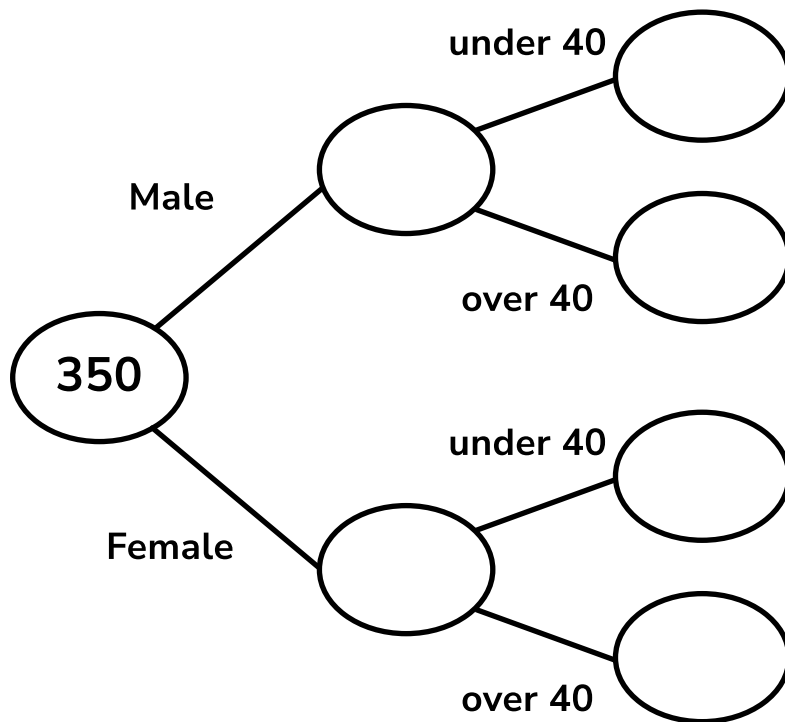
- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

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

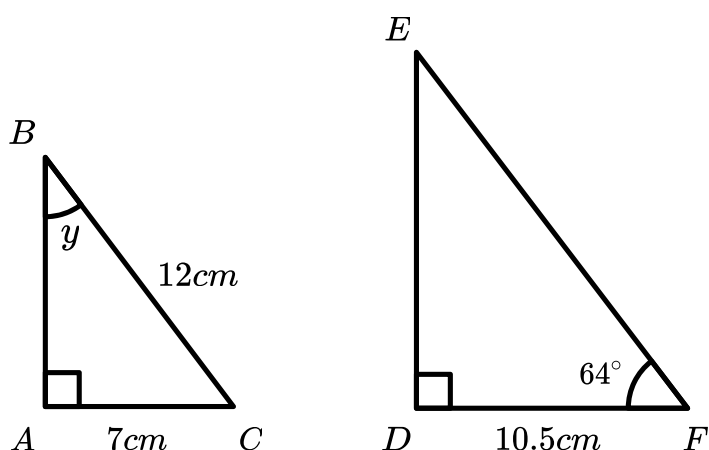
- 1 In an office, the ratio of male employees:female employees is 4:3.
Of the males, the ratio of under 40s:over 40s is 3:2.
Of the females, the ratio of under 40s:over 40s is 1:4.



Use the frequency tree to find the total ratio of employees under 40:employees over 40.

(Total for Question 1 is 4 marks)

- 2 ABC and DEF are similar triangles.



- (a) Work out the size of angle y .

.....
(1)

- (b) Work out the length EF.

..... cm
(2)

(Total for Question 2 is 3 marks)

- 3 The mean length of time that a group of 10 teachers have been working at a school is 5.5 years.
A teacher who has worked at the school for 6 years leaves and a new teacher joins the school.
Calculate the mean for the new group of teachers.

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

- 4 (a) Write the number 621000 in standard form.

(1)

- (b) Work out the value of $(8.2 \times 10^5) + (3.9 \times 10^4)$.

Give your answer in standard form.

(2)

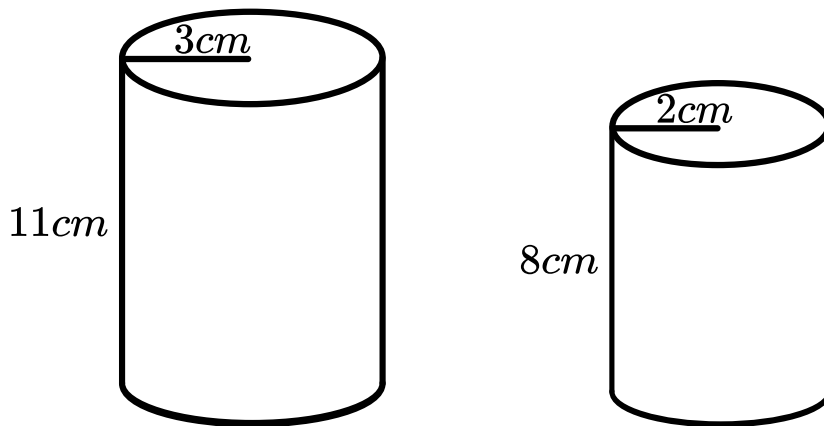
(Total for Question 4 is 3 marks)

5 $T = \frac{40M - N^2}{3}$

Make M the subject of the formula.

(Total for Question 5 is 2 marks)

- 6 A drink is available in two can sizes.



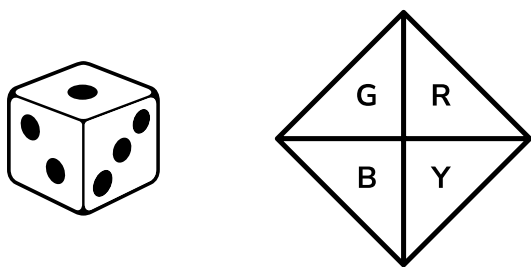
A shop sells large cans for £1 and small cans for 50p.

Is it better value to buy one large can or two small cans?

Show how you decide.

(Total for Question 6 is 3 marks)

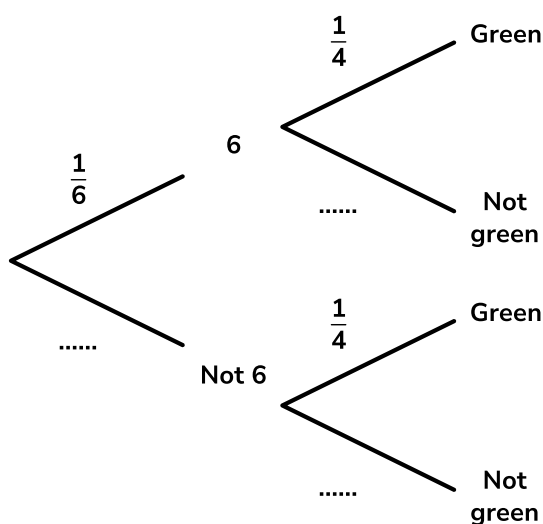
- 7 In a fairground game, players roll a dice and spin a spinner.



It costs £1 to play the game.

If a player rolls a 6 they win 50p. If a player rolls a 6 and lands on green they win £5.

- (a) Complete the tree diagram.



(1)

- (b) 120 people play the game.

Estimate the amount of profit the game makes.

£

(3)

(Total for Question 7 is 4 marks)

- 8 (a) A paddling pool holds 4800l of water.

Given that 1 litre = 1000cm^3 , find the volume of water held by the paddling pool in cm^3 .

----- cm^3

(2)

- (b) Convert the volume to m^3 .

----- m^3

(3)

- (c) Water costs £1.58 per cubic metre. Find the cost of filling the paddling pool.

£ -----

(1)

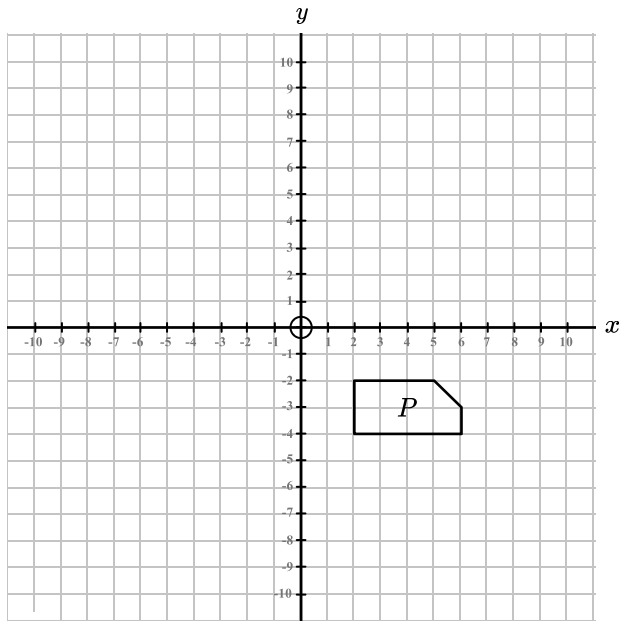
(Total for Question 8 is 5 marks)

-
- 9 The weight, w , of a sack of potatoes is 25.5kg to 3 significant figures.

Write the error interval for the weight of the sack of potatoes.

(Total for Question 9 is 2 marks)

10



(a) Enlarge shape P by scale factor -1 with centre of enlargement $(-1, 0)$. Label the shape Q .

(2)

(b) Reflect shape Q in the line $x = -1$. Label the shape R .

(1)

(c) Describe a single transformation that would take shape P to shape R .

(2)

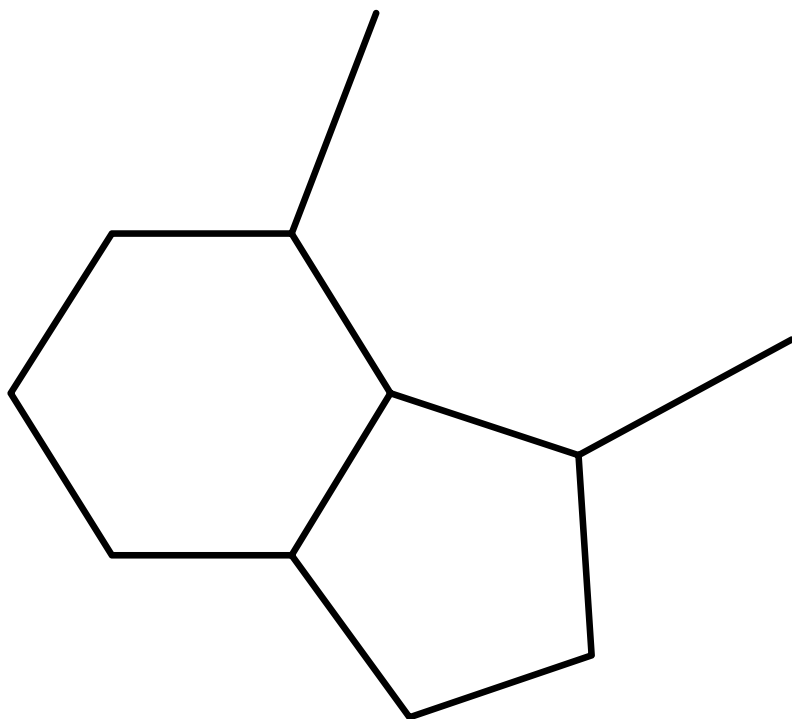
(Total for Question 10 is 5 marks)

11 Expand and simplify $(x + 3)(x - 7)(2x + 4)$

(Total for Question 11 is 2 marks)

- 12** The diagram shows a regular hexagon, a regular pentagon and a third polygon. Could the third polygon be a regular polygon?

Explain your answer.



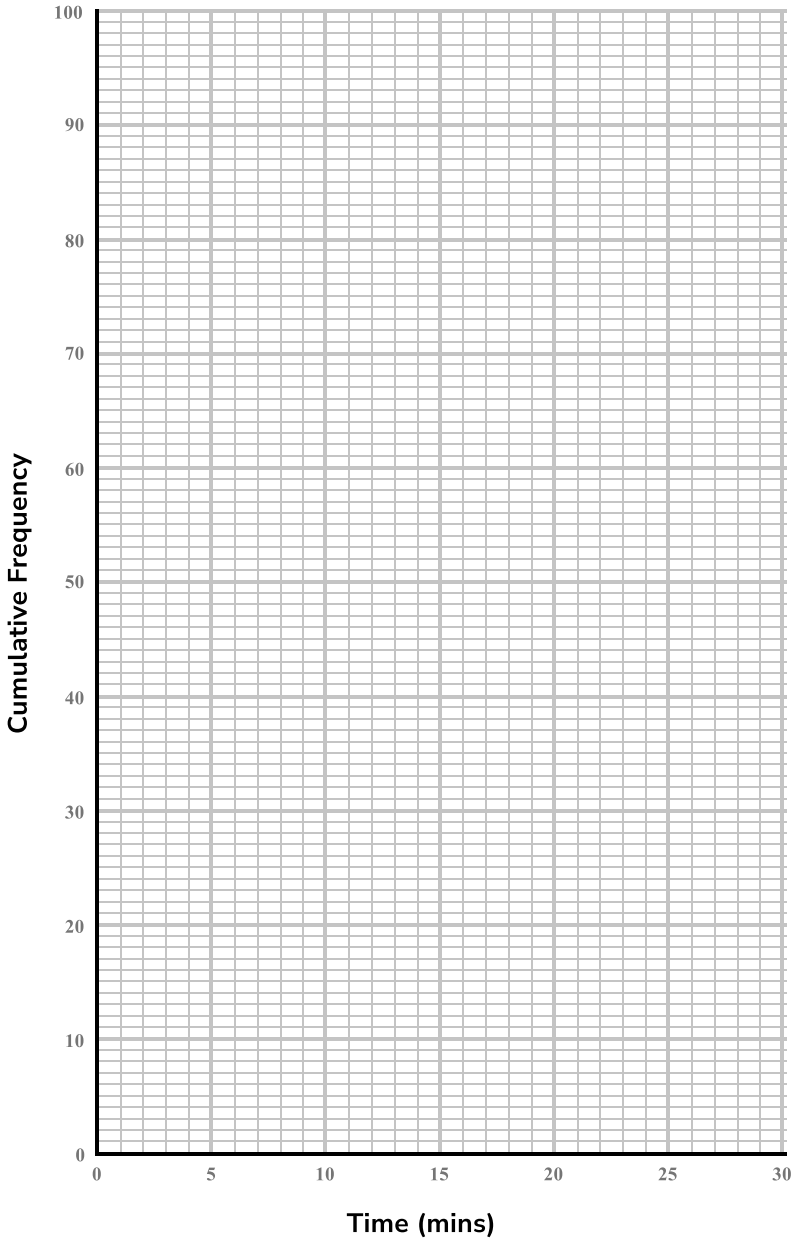
(Total for Question 12 is 3 marks)

13 The table shows data on how late Judy’s train was over 100 days.

Time (mins)	Frequency
$0 \leq t < 5$	13
$5 \leq t < 10$	19
$10 \leq t < 15$	31
$15 \leq t < 20$	18
$20 \leq t < 25$	11
$25 \leq t < 30$	8

(a) Draw a cumulative frequency graph on the grid to represent this information.

(3)



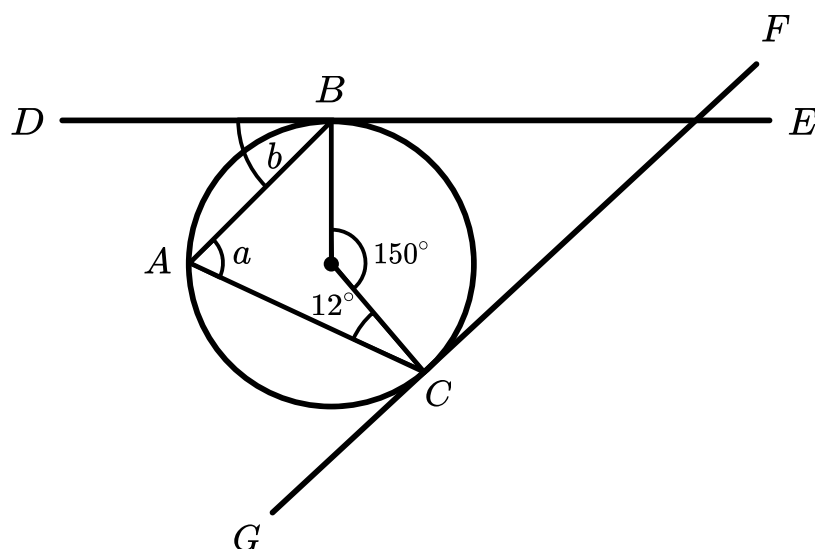
(b) Judy says that her train was more than 18 minutes late over half of the time.

Is Judy correct? Show how you decide.

(2)

(Total for Question 13 is 5 marks)

14



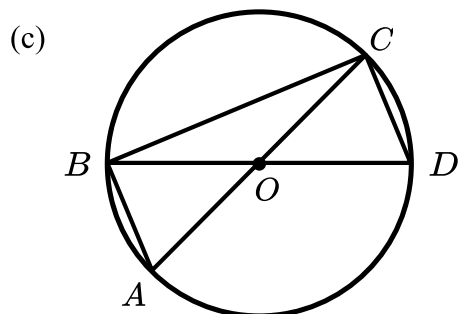
O is the centre of the circle and DE and FG are tangents to the circle.

(a) Write down the size of angle a .

(1)

(b) Work out angle b . Give reasons for each stage of your working.

(3)



O is the centre of the circle.

Prove that triangle ABC is congruent to triangle BCD.

(3)

(Total for Question 14 is 7 marks)

15 A bakery sells 8 types of sandwiches and 6 types of baguette.

5 of the sandwiches are vegetarian and 3 of the baguettes are vegetarian.

A customer purchases one sandwich and one baguette.

What percentage of the combinations include both a sandwich and a baguette that are vegetarian?

----- %

(Total for Question 15 is 3 marks)

16 For this question you may use $Density = \frac{Mass}{Volume}$

Material A has a density of 2.6g/cm^3 and material B has a density of 6.1g/cm^3 .

Material C is formed by combining 200cm^3 of metal A and 150cm^3 of metal B.

Work out the density of metal C.

 g/cm^3

(Total for Question 16 is 3 marks)

17 (a) Write $x^2 + 4x + 9$ in the form $(x + a)^2 + b$ where a , b and c are integers.

(2)

(b) Hence write down the coordinates of the turning point of the graph $y = x^2 + 4x + 9$.

(1)

(c) Tick the correct box:

☐ $x^2 + 4x + 9 = 0$ has 0 real roots

☐ $x^2 + 4x + 9 = 0$ has 1 real root

☐ $x^2 + 4x + 9 = 0$ has 2 real roots

(1)

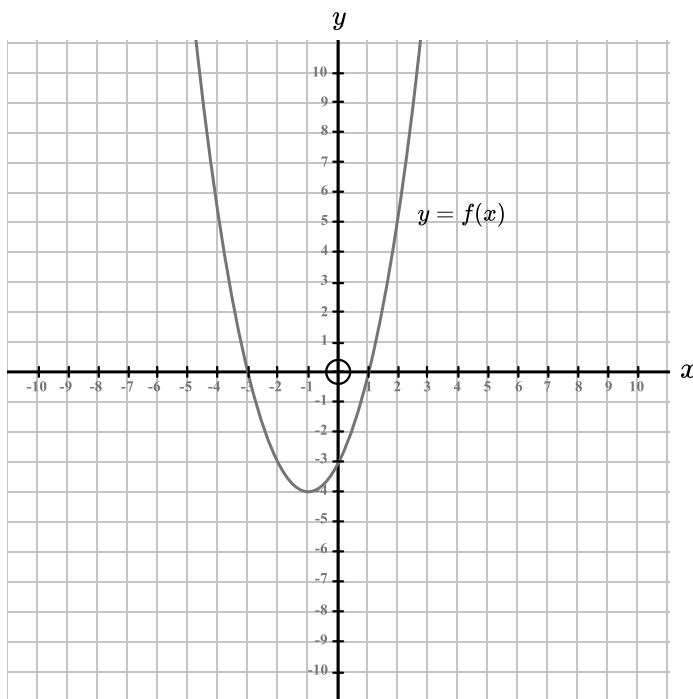
(Total for Question 17 is 4 marks)

18 $9^x \times 81^y$ can be written as 3^z .

Show that $z = 2x + 4y$.

(Total for Question 18 is 3 marks)

19 The minimum point of the graph of $y = f(x)$ is $(-1, -4)$.



(a) The curve is translated so that the minimum point is mapped to $(-1, 1)$.

Write down the equation of the translated curve.

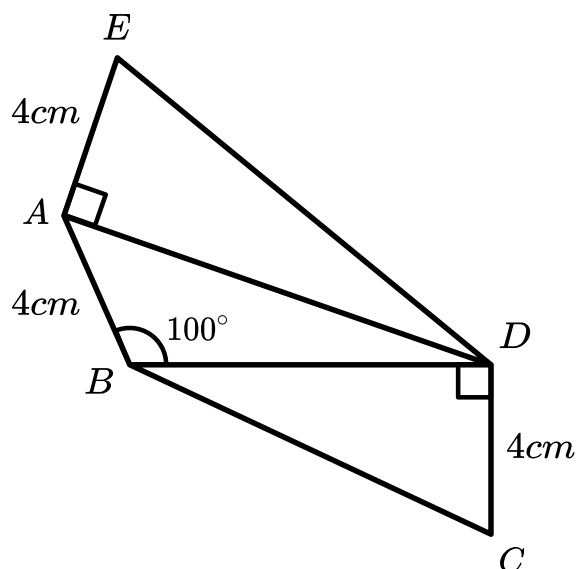
(1)

(b) On the grid sketch the graph of $y = -f(x)$

(2)

(Total for Question 19 is 3 marks)

20



The area of triangle BCD is 18cm^2 .

Find the area of triangle ADE.

Give your answer to 1 decimal place.

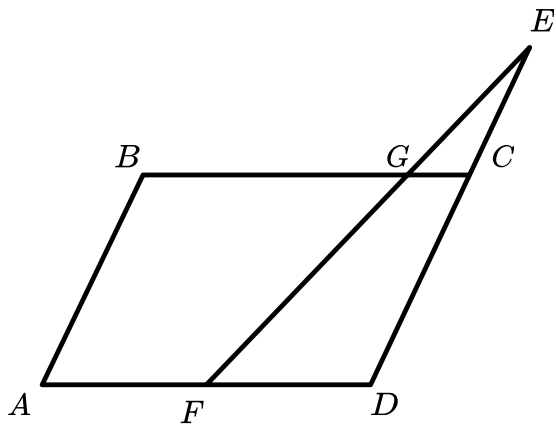
cm²

(Total for Question 20 is 4 marks)

- 21 Show that $\frac{x+2}{3x+7} \div \frac{2x+4}{8x+5}$ can be written in the form $\frac{ax+b}{cx+d}$ where a , b , c and d are integers.

(Total for Question 21 is 3 marks)

22



ABCD is a parallelogram.

$$\overrightarrow{AB} = a$$

$$\overrightarrow{AD} = b$$

$$AF = \frac{1}{2} AD$$

$$DE = \frac{3}{2} DC$$

(a) Find the vector \overrightarrow{FB} .

(2)

(b) Given that FGE is a straight line, find the ratio $BG : GC$.

(4)

(Total for Question 22 is 6 marks)

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