THIRD SPACE LEARNING

Paper 3 (Calculator) Higher

Edexcel

THIRD SPACE LEARNING

Name

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.

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

This practice paper is based on the topics from the **advanced information for the Summer 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 Here is a list of ingredients for 12 cupcakes.

Butter	120g
Sugar	150g
Eggs	2
Flour	160g

(a) Thais wants to make 30 cupcakes. Thais has 300 g butter, 500g sugar, 10 eggs and 350g flour. Does Thais have enough ingredients? Show how you decide.

(3)

(b) i) Write down the ratio of butter to sugar in the recipe.

(1)

ii) Write your ratio in the form 1:n

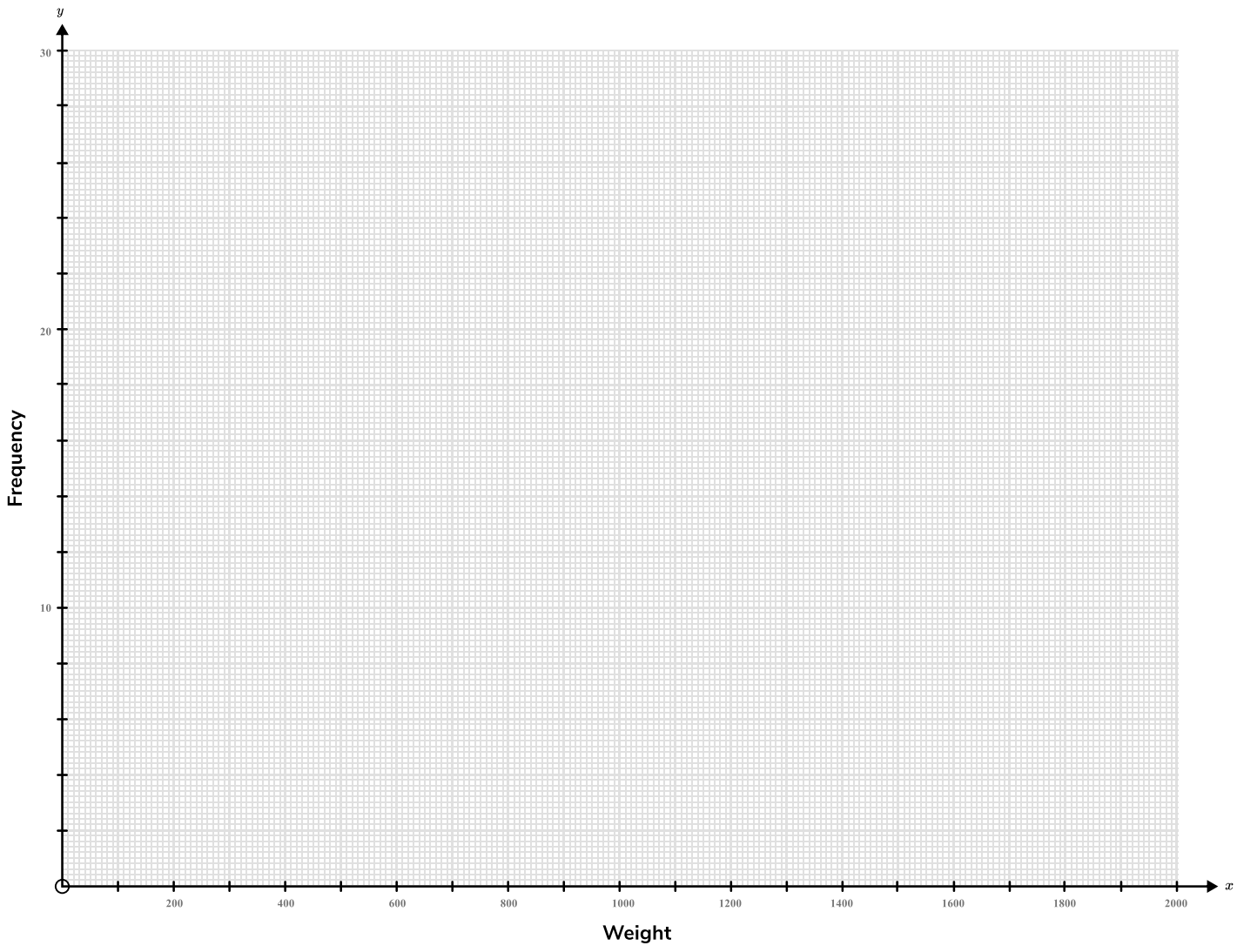
(2)

(Total for Question 1 is 6 marks)

2 Lisa collected some information about the weights of the parcels taken to the post office one day.

Weight	Number of parcels
$0 < w \leq 500g$	15
$500 < w \leq 1000g$	28
$1000 < w \leq 1500g$	14
$1500 < w \leq 2000g$	7

Draw a frequency polygon to represent this information.



(Total for Question 2 is 3 marks)

3 Austin goes on a journey. His journey is broken into three sections.

	Distance	Time
Section A	40km	1 hour
Section B	30km	0.5 hours
Section C	60km	2 hours

(a) During which section of the journey is Austin travelling at the greatest speed?

.....

(2)

(b) Austin has calculated that to be on time, his average speed must be above 36km/h. Will Austin be on time? Show how you decide.

.....

(2)

(c) Yasmin does the same journey. Yasmin takes 225 minutes. Convert Yasmin's time to hours. Give your answer as a decimal

.....

(1)

(Total for Question 3 is 5 marks)

4 A furniture store is having a 20% sale.

(a) A sofa usually costs £1200. Work out the sale price of the sofa.

£.....

(2)

(b) The sale price of a table is £480. Work out the original price of the table.

£.....

(2)

(Total for Question 4 is 4 marks)

5 (a) Make y the subject of the formula $x^2 + y = 8(2y + w)$

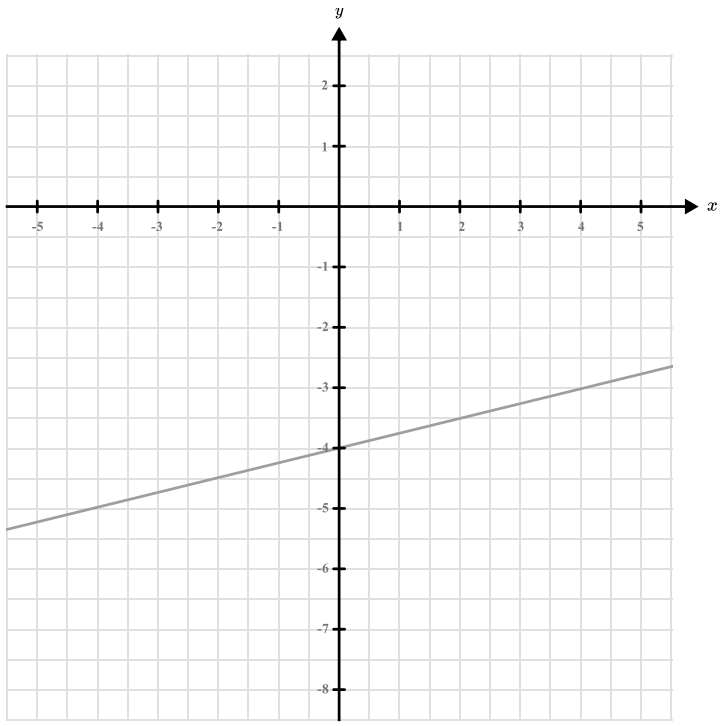
(2)

(b) Find the value of y when $x = -4$ and $w = -7$

(2)

(Total for Question 5 is 4 marks)

6



(a) Work out the gradient of the line.

(2)

(b) Write down the equation of the line.

(2)

(Total for Question 6 is 4 marks)

7 Lina picks a 4 digit number.

The number is more than 5000.

The number is odd.

The second digit is a prime number.

How many different possible numbers could Lina pick?

(Total for Question 7 is 3 marks)

---

8 $a = \begin{pmatrix} 3 \\ -4 \end{pmatrix}$ $b = \begin{pmatrix} -2 \\ -7 \end{pmatrix}$

(a) Circle the vector that is parallel to vector **a**.

$\begin{pmatrix} -3 \\ -4 \end{pmatrix}$ $\begin{pmatrix} 12 \\ -16 \end{pmatrix}$ $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$ $\begin{pmatrix} -12 \\ -16 \end{pmatrix}$

(1)

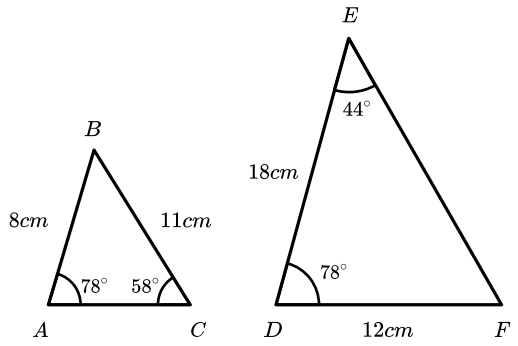
Write **a**-2**b** as a column vector.

(2)

(Total for Question 8 is 3 marks)

---

9 ABC and DEF are two triangles.



(a) Explain how we know that ABC and DEF are similar.

.....

.....

(1)

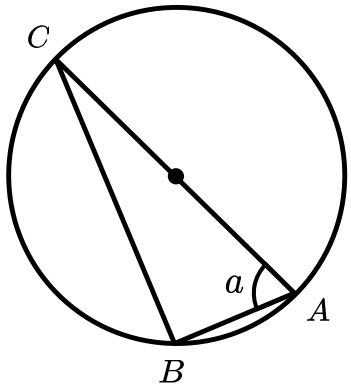
(b) Work out the length of the side EF.

.....*cm*

(2)

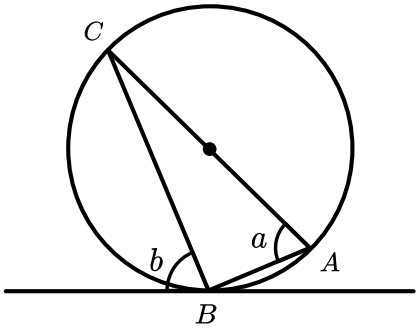
(Total for Question 9 is 3 marks)

10 (a) The vertices of triangle ABC lie on the circumference of a circle with diameter 12cm. The length of the chord BC is 10.5cm. Work out the size of angle A. Give your answer to 1 decimal place.



(3)

(b) i) A tangent to the circle is drawn at point B. Write down the size of angle b.



(1)

(b) ii) Give a reason for your answer

……

……

(1)

(Total for Question 10 is 5 marks)

11 The number of fish in a shoal at the beginning of year n is P_n. The number of fish in the shoal at the beginning of the next year is given by

$$P_{n+1} = 1.4(P_n - 90)$$

At the start of 2019 there were 380 fish in the shoal. Work out how many fish were in the shoal at the start of 2022.

(Total for Question 11 is 2 marks)

12 Niamh has a bag containing 6 yellow marbles and 8 red marbles. Niamh picks two marbles at random from the bag. Find the probability that the two marbles are different colours.

(Total for Question 12 is 4 marks)

13 An area of forest is being cleared. No new trees are being planted and the number of trees in the forest is given by $T = 250000 \times 0.9^n$, where n is the number of years after deforestation begins.

(a) What does 25000 represent in this formula?

.....

.....

(1)

(b) What percentage of the trees are being chopped down each year?

(1)

(c) After how many years will the number of trees drop below 12000?

(2)

(Total for Question 13 is 4 marks)

---

14 (a) Expand and simplify $(x + 4)(5x - 2)(2x + 3)$

(3)

(b) Factorise $4x^2 - 25y^2$

(2)

(Total for Question 14 is 5 marks)

---

15 In a car park the ratio of red cars to green cars is 3:5 and the ratio of green cars to blue cars is 4:7. In total there are 536 cars. Work out the number of red cars.

(Total for Question 15 is 3 marks)

---

16 (a) Fred says $2^5 \times 2^4 = 4^9$

Explain Fred's mistake.

.....

.....

(1)

(b) $2 \times \sqrt{8} = 2^n$

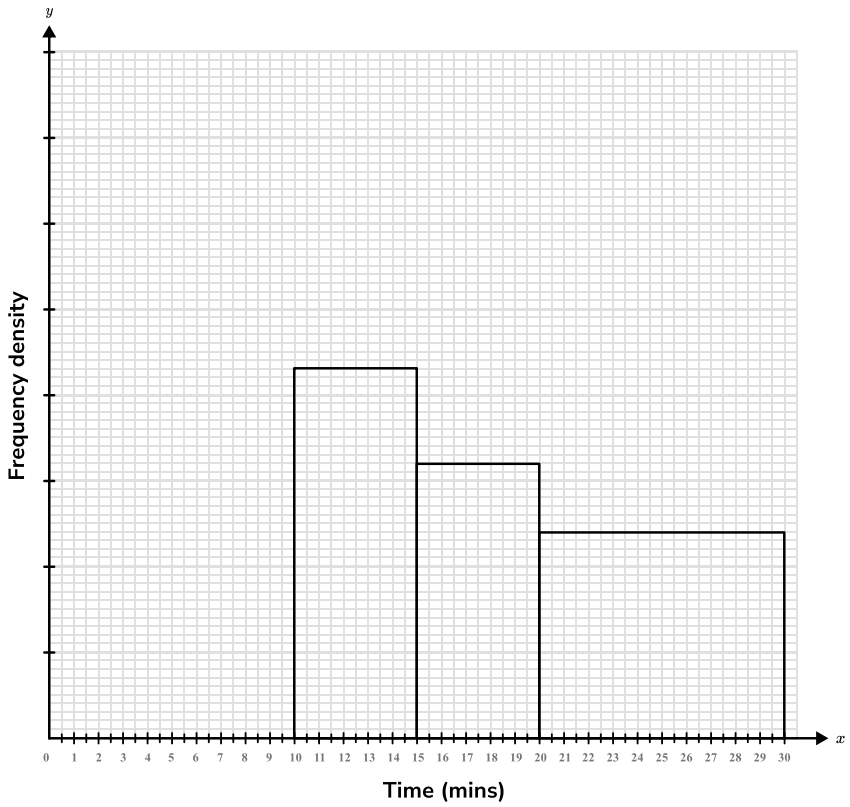
Find the value of n.

(2)

(Total for Question 16 is 3 marks)

---

17 This histogram shows how long it takes a group of athletes to get to their training session.



(a) 43 athletes take between 10 and 15 minutes to get to the training session.

How many athletes take between 20 and 30 minutes?

(3)

(b) 14 athletes take between 0 and 10 minutes to get to the training session.

Add this information to the histogram.

(1)

(Total for Question 17 is 4 marks)

18 The area of a table top is $3.8m^2$ to 1 decimal place.

The length of the table is 2.4m to 2 significant figures.

Calculate the upper bound for the width of the rectangular table top. Give your answer to 3 decimal places.

You must show your workings.

..... m

(3)

(Total for Question 18 is 3 marks)

---

19 Find the points of intersection of the circle $x^2 + y^2 = 25$ and the line $y - 3x + 5 = 0$. Show each stage of your working clearly.

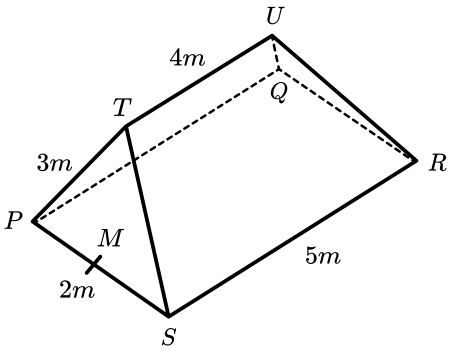
(Total for Question 19 is 5 marks)

20 Here is a diagram of a roof.

The base of the roof, PQRS, is a rectangle measuring 2m by 5m.

The ends of the roof are isosceles triangles.

The sides of the roof are isosceles trapeziums.



(a) Calculate the length MT, where M is the midpoint of PS. Give your answer as an exact value.

..... m

(2)

(b) Calculate the angle between MT and the base of the roof. Give your answer to 1 decimal place.

..... °

(2)

(c) Calculate the area of the side of the roof RSTU. Give your answer to 3 significant figures.

..... m^2

(2)

(Total for Question 20 is 7 marks)

Help ease the pressure with a personalised revision programme for each of your target KS4 students

Our one to one GCSE revision programme is designed to help your target students reach their potential in their GCSE maths exams.

Our specialist maths tutors work one to one with each student, focusing on securing core KS4 content and building familiarity with the kinds of questions they'll be tackling in their GCSE exams.

Get in touch today:

hello@thirdspacelearning.com

thirdspacelearning.com

0203 771 0095

THIRD SPACE LEARNING