THIRD SPACE LEARNING

Paper 2 (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 (a) Calculate $\sqrt{4.02 + 12.7} + (19.2 - 3.73)^3$. Write down all the digits on your calculator display.

(2)

(b) Round your answer to 3 significant figures.

(1)

(Total for Question 1 is 3 marks)

---

2 The ratio of male:female employees in a company is 5:8. There are 27 more female employees than male employees. How many employees does the company have?

(Total for Question 2 is 2 marks)

---

3 Lorraine and Megan go on holiday to Rome.
Lorraine converts £150 to euros.
The exchange rate is £1=€1.19.

(a) How many euros does she each receive?

€

(2)

(b) On the last evening they go for a meal.

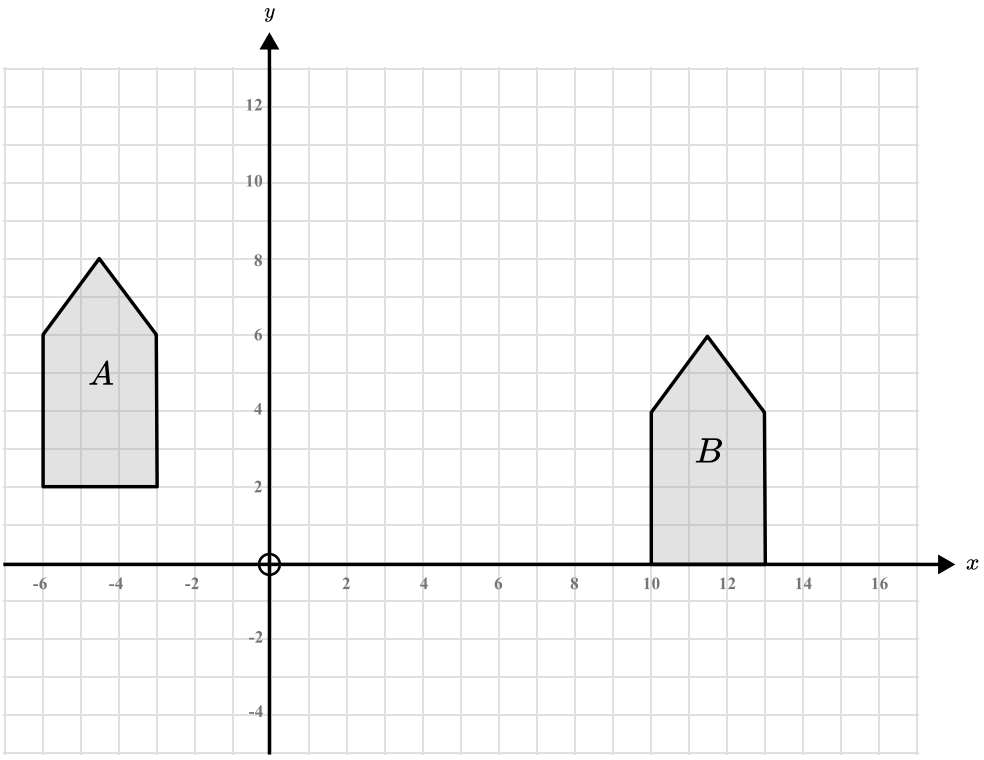
Pizza	€10
Pasta	€11.0
Ice cream	€4.25
Tiramisu	€4.20
Drink	€1.95

Lorraine orders a pizza, an ice cream and a drink and Megan orders a pizza, a tiramisu and a drink. Lorraine has €20 left and Megan has €15 left. Do they have enough money in total to pay for the meal? Show how you decide.

(2)

(Total for Question 3 is 4 marks)

4



(a) Rotate shape A 90° clockwise about the origin **(2)**

(b) Mark says that the transformation to get from shape A to shape B is a translation of $\begin{pmatrix} 13 \\ -2 \end{pmatrix}$

Is Mark correct? Explain your answer.

.....

.....

(2)

(Total for Question 4 is 5 marks)

---

5 (a) Expand and simplify $3(7q+5) - 2(3q-4)$

(2)

(b) Factorise $x^2 + 6x$

(1)

(c) Expand and simplify $(2x + 3)(3x - 5)$

(2)

(Total for Question 5 is 5 marks)

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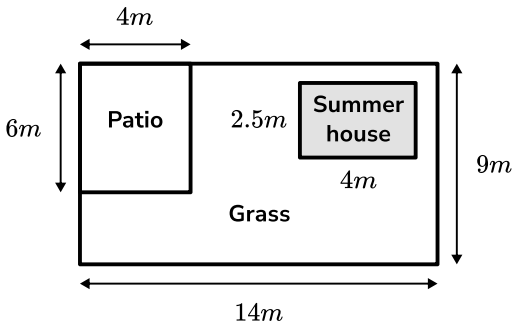
6 Here is a diagram of Nooha's garden.



(a) Find the total grassed area.

.....m^2

(3)

(b) Convert the area to cm^2.

.....cm^2

(2)

(Total for Question 6 is 5 marks)

---

7 A car is bought for £12000. The value of the car depreciates by 10% per year. Find the value of the car after 2 years.

.....

(Total for Question 7 is 3 marks)

---

8 Simplify $\frac{6a^3b^2 \times 2a^4b}{3a^2b^{-3}}$

.....

(Total for Question 8 is 2 marks)

9 (a) Amber, Ollie and Tommy each complete some homework. Tommy takes 12 minutes longer than Ollie and Amber takes twice as long as Tommy. Altogether they spend 2 hours and 16 minutes on homework. Form an equation using this information.

.....

(2)

(b) Solve your equation and hence work out how long they each spend doing homework.

Amber .....

Ollie .....

Tommy .....

(2)

(Total for Question 9 is 4 marks)

---

10 The weight of a horse is 350kg to the nearest 10kg. Complete the error interval for the mass of the horse.

..... ≤ mass (kg) < .....

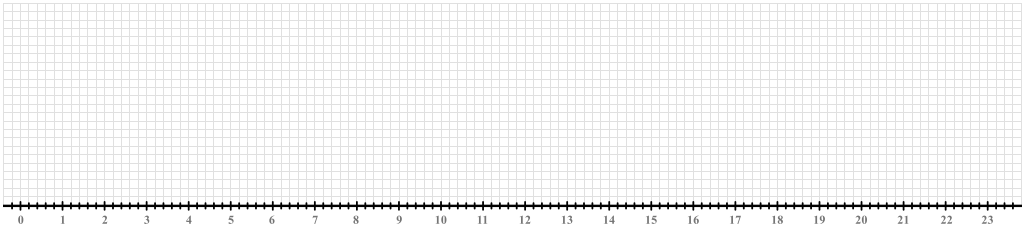
(Total for Question 10 is 2 marks)

---

11 There are 11 dogs in group A. Here are their weights in kg:

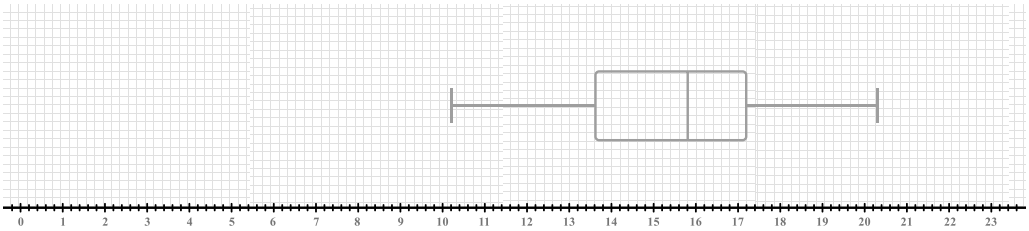
6.4 13.1 8.9 17.5 11.0 9.4 11.7 19.1 12.4 11.6 8.2

(a) Draw a box and whisker diagram to show this data.



(3)

(b) Here is a box and whisker diagram showing information about the weights of the dogs in group B.



Compare the distributions of the weights of the dogs in group A and group B.

……

……

(2)

(Total for Question 11 is 5 marks)

12 (a) Here are the equations of 4 lines:

$y - 3x + 4 = 0$ $\quad 4y + 3x = 10$ $\quad y = \frac{2}{3}x - 2$ $\quad y = 2 - \frac{3}{4}x$

Write down the equations of the two lines that are parallel.

_____ and _____

(2)

(b) Find the equation of the line that is parallel to $y = 5x + 7$ and passes through the point (1, 2)

_____

(2)

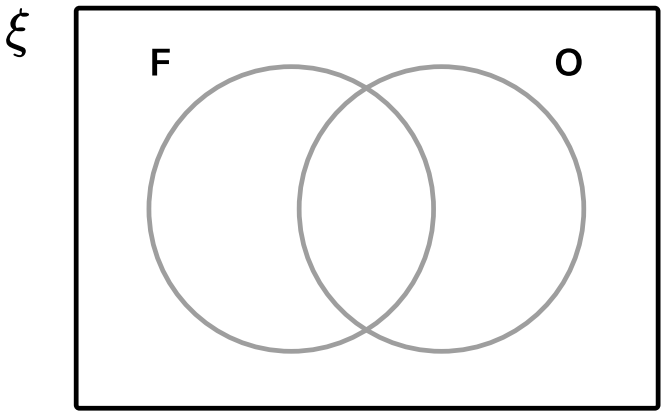
(Total for Question 12 is 4 marks)

13 $\xi=\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$

F=factors of 12

O=odd numbers

(a) Complete the Venn diagram.



(2)

(b) One of the numbers is chosen at random.

Write down P(F∩O)

(2)

(c) Another number is chosen at random. Given that it is not a factor of 12, find the probability that it is an odd number.

(2)

(Total for Question 13 is 6 marks)

14 (a) y is inversely proportional to the square root of x. y=30 when x=25.

Find the value of y when x=16.

(Total for Question 14 is 2 marks)

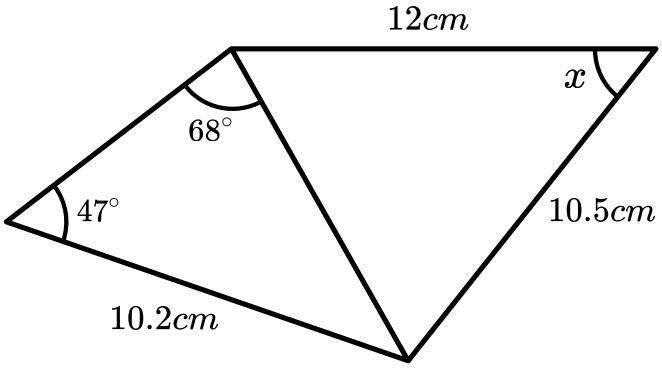
15 Emma wants to know the number of rabbits living on an area of farmland. One day Emma captures and tags 24 rabbits. A few days later, she captures 30 rabbits and 8 of them are tagged. Estimate the number of rabbits living on the farmland.

(Total for Question 15 is 2 marks)

16 Solve $x^2 \leq x + 20$.

(Total for Question 16 is 3 marks)

17 Work out the size of angle x. Give your answer correct to 3 significant figures.



(Total for Question 17 is 4 marks)

18 $f(x) = x^2 + 4$ and $g(x) = 2x - 1$

(a) Find $g^{-1}(x)$

(2)

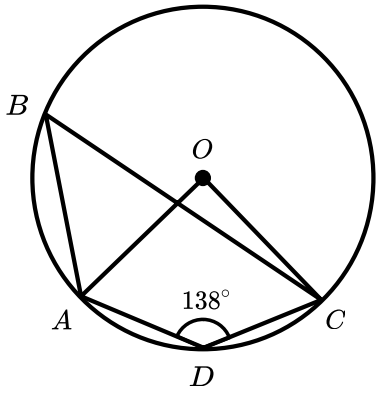
(b) Find $gf(x)$, giving your answer in its simplest form.

(2)

(Total for Question 18 is 4 marks)

(Total for Question 17 is 4 marks)

19 (a) Work out the size of the acute angle AOC.

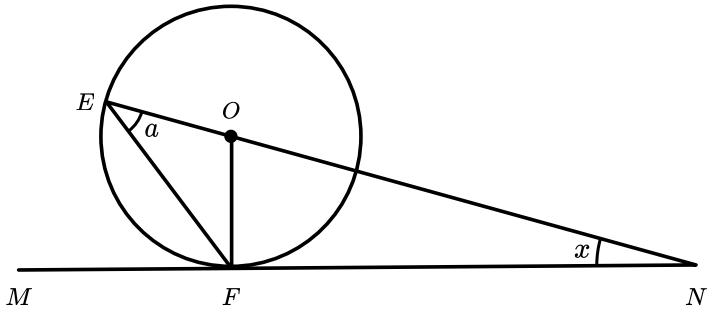


(2)

(b) The points E and F lie on the circumference of the circle.

O is the centre of the circle.

The straight line MN is a tangent to the circle.



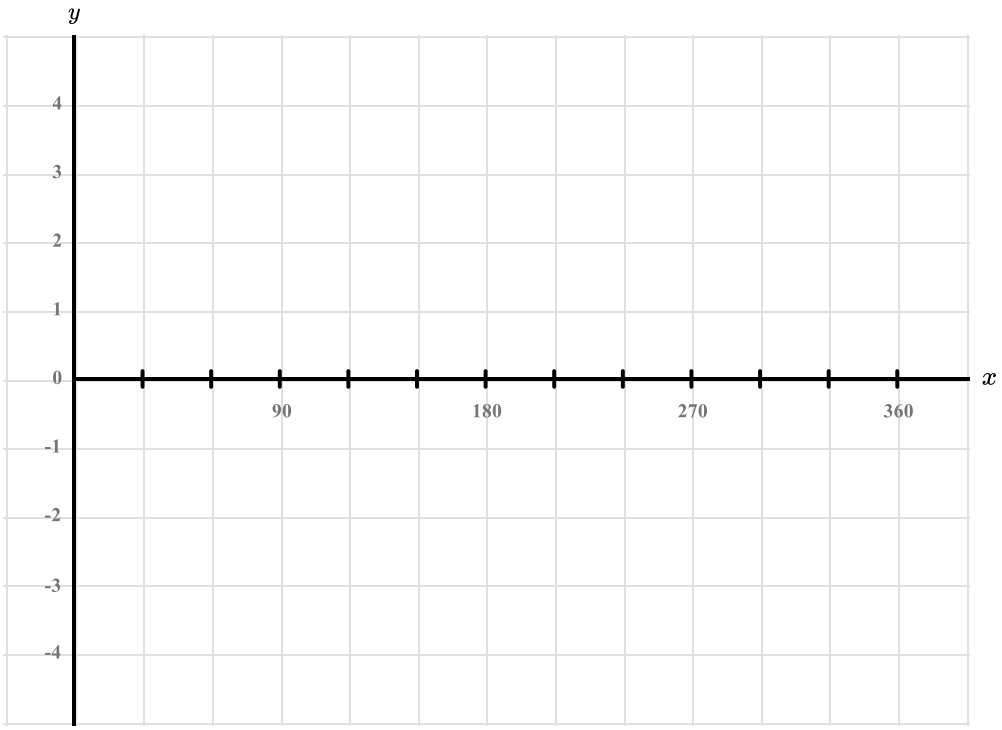
Show that angle $a = 45 - \frac{1}{2}x$

Give a reason for each step of your working.

(4)

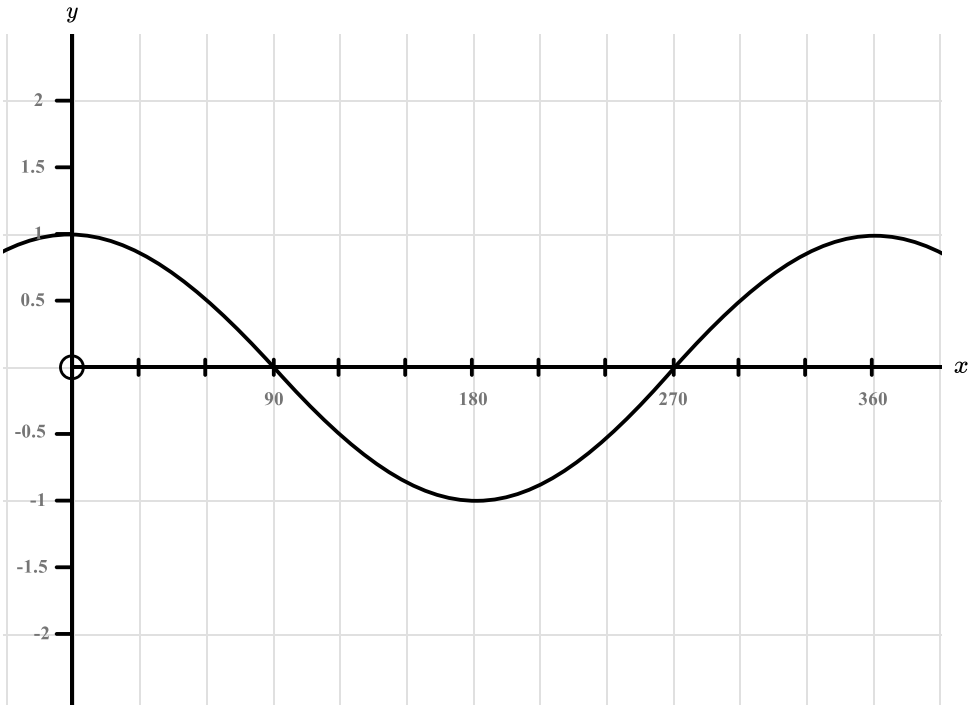
(Total for Question 19 is 6 marks)

20 (a) Sketch the graph of $y = tan(x)$ for $0^\circ \leq x \leq 360^\circ$.



(1)

(b) Here is the graph of $y = cos(x)$:



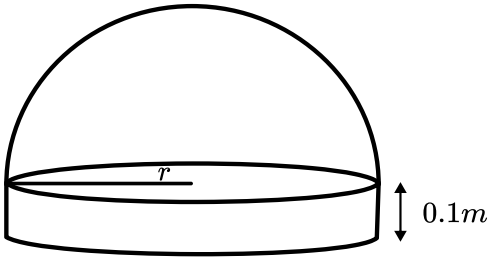
Write down the coordinates of the minimum point of the graph of $y = cos(x) - 1$ in the range $0^\circ \leq x \leq 360^\circ$.

(2)

(Total for Question 20 is 3 marks)

21 A sculpture is formed by placing a hemisphere on top of a cylinder.

$$Volume\ of\ sphere = \frac{4}{3}\pi r^3$$



(a) Show that the volume of the sculpture is given by $\pi r^2(0.1+\frac{2}{3}r)$

(2)

(b) The sculpture exerts a force of 800N on the table. The pressure on the table is 2825N/m^2.

Work out the volume of the sculpture. Give your answer correct to 2 significant figures.

$$Pressure = \frac{Force}{Area}$$

..... m^3

(4)

(Total for Question 21 is 6 marks)

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