

Surname

Other names

Centre Number

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Candidate Number

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GCSE Mathematics

Predicted Practice Paper

PAPER 3 (Calculator)

Higher Tier

Predicted paper for Summer 2027 examinations

Written in the style of the AQA 8300 specification

Time: 1 hour 30 minutes

Total marks: 80

IMPORTANT — PLEASE READ: PREDICTED PRACTICE PAPER — not an official AQA paper, not a past paper, and not endorsed by or affiliated with AQA. All questions are original. Topics were chosen by analysing previous exam papers, but they are NOT guaranteed to appear in any real examination. Revise the full specification.

You must have:

A calculator, mathematical instruments (ruler graduated in centimetres and millimetres, protractor, pair of compasses), pen, HB pencil, eraser.

Instructions

- Answer every question.
- Write your answers in the spaces provided and show all your working clearly.
- You may use a calculator at any point in this paper.
- Diagrams are not drawn accurately unless the question says otherwise.

Information

- The paper is worth 80 marks in total.
- The marks available for each question are shown in brackets — use them to judge how long to spend.

Advice

- Read each question carefully before you begin.
- Attempt every question, even if you are unsure.
- If you finish early, use the time to check your answers.

Turn over

Answer ALL questions.
Write your answers in the spaces provided.
You must write down all the stages in your working.

1 (a) Write 72 as a product of its prime factors.

Give your answer in index form.

(b) Write down the lowest common multiple (LCM) of 8 and 12.

----- (2)

----- (1)

(Total for Question 1 is 3 marks)

DO NOT WRITE IN THIS AREA

2 A jacket costs £25 before a sale.
In the sale the price is increased by 8%.
Work out the new price of the jacket.

(Total for Question 2 is 2 marks)

3 Work out the size of an exterior angle of a regular nonagon (9-sided polygon).

(Total for Question 3 is 2 marks)

DO NOT WRITE IN THIS AREA

4 Share £180 between Priya and Sam in the ratio 4 : 5.

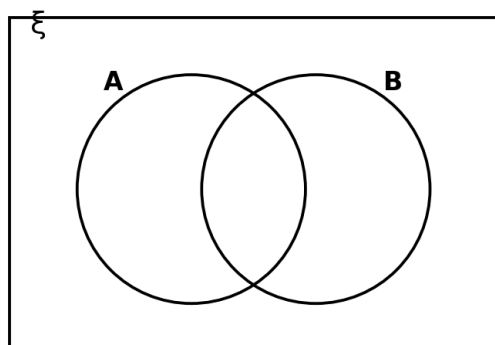
(Total for Question 4 is 2 marks)

DO NOT WRITE IN THIS AREA

5 The numbers 1 to 12 are shown in the Venn diagram.

A = factors of 12.

B = even numbers.



(a) Complete the Venn diagram.

..... (2)

(b) A number is chosen at random from the numbers 1 to 12. Work out the probability that the number is in both A and B.

..... (1)

(Total for Question 5 is 3 marks)

DO NOT WRITE IN THIS AREA

6 (a) Write 0.000045 in standard form.

----- (1)

(b) Work out $(3 \times 10^5) \times (4 \times 10^2)$. Give your answer in standard form.

----- (2)

(Total for Question 6 is 3 marks)

DO NOT WRITE IN THIS AREA

7 Here are the first five terms of a sequence:

7, 12, 17, 22, 27.

Find an expression, in terms of n , for the n th term of the sequence.

(Total for Question 7 is 2 marks)

DO NOT WRITE IN THIS AREA

8 The line L has equation $y = 3x - 2$.

(a) Write down the gradient of L.

----- (1)

(b) The line M is parallel to L and passes through the point (0, 5). Write down the equation of M.

----- (1)

(Total for Question 8 is 2 marks)

DO NOT WRITE IN THIS AREA

9 Work out $2\frac{1}{3} \div \frac{4}{5}$.

Give your answer as a mixed number in its simplest form.

(Total for Question 9 is 3 marks)

DO NOT WRITE IN THIS AREA

10 The length of a wooden plank is 2.4 m, measured to the nearest 0.1 m.

(a) Write down the upper bound of the length of the plank.

----- (1)

(b) Eight of these planks are placed end to end in a straight line. Work out the greatest possible total length.

----- (2)

(Total for Question 10 is 3 marks)

DO NOT WRITE IN THIS AREA

11 £4000 is invested at a compound interest rate of 2.5% per year.
Work out the value of the investment after 3 years.
Give your answer to the nearest penny.

(Total for Question 11 is 3 marks)

DO NOT WRITE IN THIS AREA

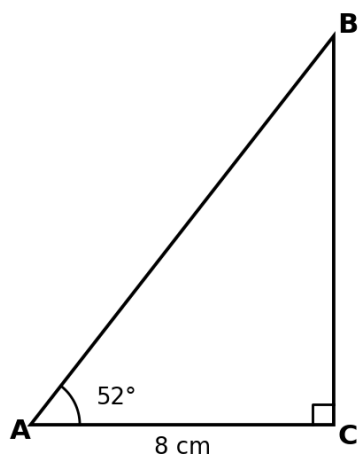
12 Amara cycles 18 km in 45 minutes.
Ben cycles 24 km in 70 minutes.
Who cycles faster? You must show your working.

(Total for Question 12 is 3 marks)

DO NOT WRITE IN THIS AREA

13 Triangle ABC is right-angled at C. $AC = 8$ cm and angle $BAC = 52^\circ$.

Diagram not drawn accurately



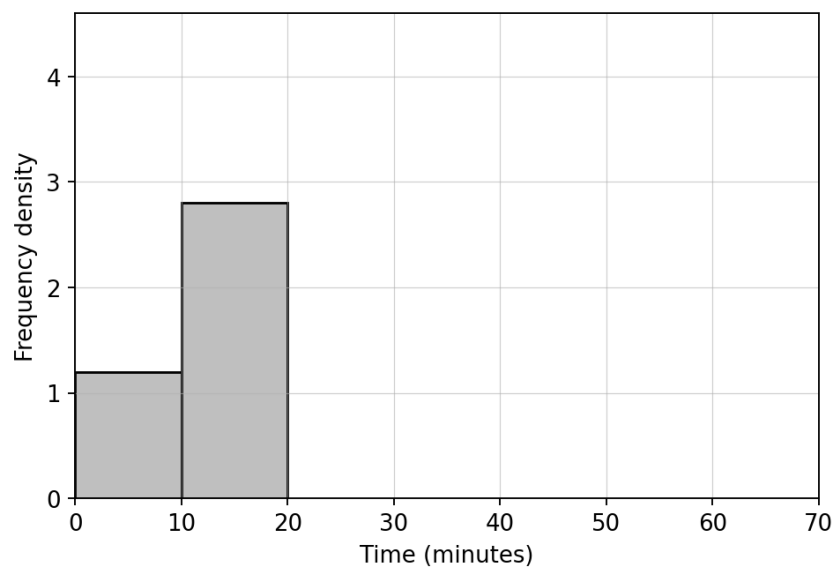
Work out the length of AB. Give your answer to 3 significant figures.

DO NOT WRITE IN THIS AREA

(Total for Question 13 is 3 marks)

14 The table shows the times, in minutes, taken by 100 students to complete a puzzle.

Time (t minutes)	Frequency
$0 < t \leq 10$	12
$10 < t \leq 20$	28
$20 < t \leq 30$	40
$30 < t \leq 50$	36
$50 < t \leq 70$	4



(a) Complete the histogram.

----- (2)

DO NOT WRITE IN THIS AREA

(b) Estimate the number of students who took more than 45 minutes.

----- (1)

(Total for Question 14 is 3 marks)

15 Solve the simultaneous equations

$$3x + 2y = 19$$

$$x - 2y = 1$$

(Total for Question 15 is 3 marks)

DO NOT WRITE IN THIS AREA

16 y is directly proportional to x . When $x = 4$, $y = 20$.

(a) Find the value of y when $x = 7$.

----- (1)

z is inversely proportional to w^2 . When $w = 2$, $z = 18$.

(b) Find the value of z when $w = 3$.

----- (2)

(Total for Question 16 is 3 marks)

DO NOT WRITE IN THIS AREA

17 Work out $16\frac{3}{4} + 27^{-\frac{2}{3}}$.

Give your answer as a mixed number in its simplest form.

(Total for Question 17 is 3 marks)

DO NOT WRITE IN THIS AREA

- 18** (a) Simplify $3\sqrt{20} - \sqrt{45}$, giving your answer in the form $a\sqrt{5}$, where a is an integer.

----- (2)

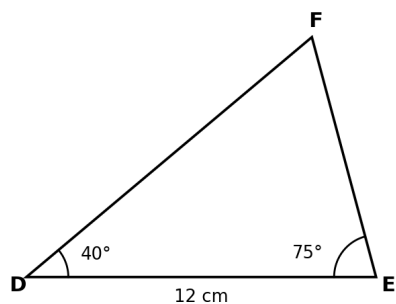
- (b) Rationalise the denominator of $6/\sqrt{3}$, giving your answer in its simplest form.

----- (1)

(Total for Question 18 is 3 marks)

DO NOT WRITE IN THIS AREA

19 In triangle DEF, angle D = 40° , angle E = 75° and DE = 12 cm.
Diagram not drawn accurately

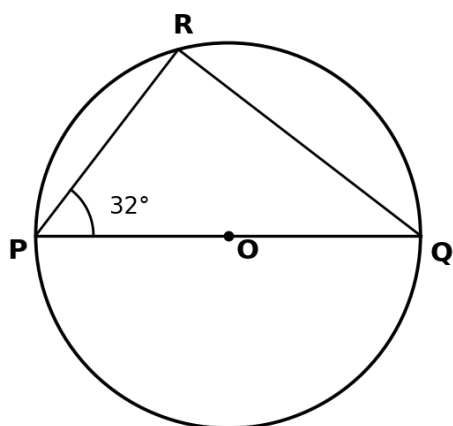


Work out the length of DF. Give your answer to 3 significant figures.

DO NOT WRITE IN THIS AREA

(Total for Question 19 is 3 marks)

- 20** PQ is a diameter of a circle with centre O. R is a point on the circumference.
Angle QPR = 32° .
Diagram not drawn accurately



- (a) Work out the size of angle PRQ. Give a reason for your answer.

----- (2)

- (b) Work out the size of angle PQR.

----- (1)

(Total for Question 20 is 3 marks)

DO NOT WRITE IN THIS AREA

21 Make x the subject of the formula $y = (3x + 1)/(x - 2)$.

(Total for Question 21 is 3 marks)

DO NOT WRITE IN THIS AREA

22 A rectangle has length $(x + 5)$ cm and width $(x - 1)$ cm.

The area of the rectangle is 48 cm^2 .

(a) Show that $x^2 + 4x - 53 = 0$.

----- (2)

(b) Solve $x^2 + 4x - 53 = 0$. Give your answers correct to 3 significant figures.

----- (2)

(Total for Question 22 is 4 marks)

DO NOT WRITE IN THIS AREA

23 (a) Write $x^2 + 8x + 3$ in the form $(x + a)^2 + b$, where a and b are integers.

----- (2)

(b) Write down the coordinates of the turning point of the curve $y = x^2 + 8x + 3$.

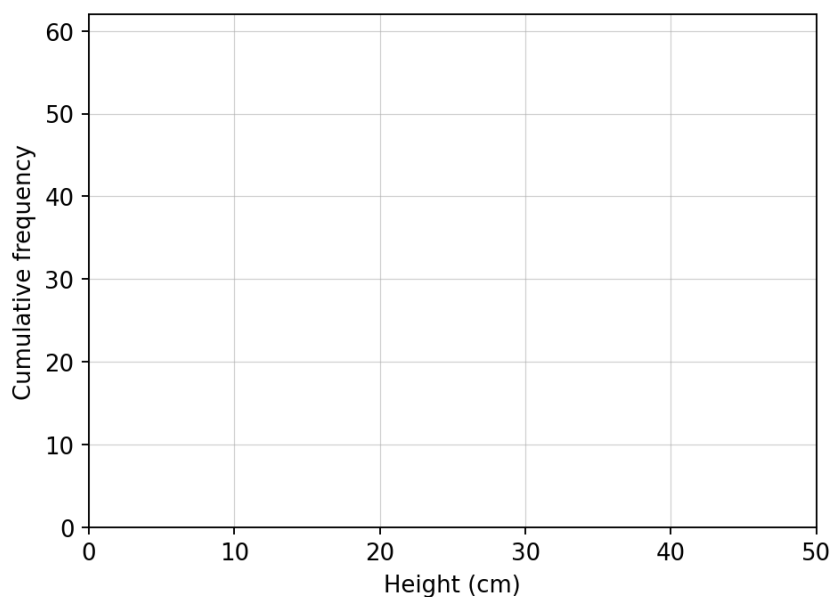
----- (1)

(Total for Question 23 is 3 marks)

DO NOT WRITE IN THIS AREA

24 The table shows the heights of 60 plants.

Height (h cm)	Frequency	Cumulative frequency
$0 < h \leq 10$	6	
$10 < h \leq 20$	14	
$20 < h \leq 30$	22	
$30 < h \leq 40$	12	
$40 < h \leq 50$	6	



(a) Complete the cumulative frequency table.

----- (1)

DO NOT WRITE IN THIS AREA

(b) Draw a cumulative frequency graph for this information.

----- (2)

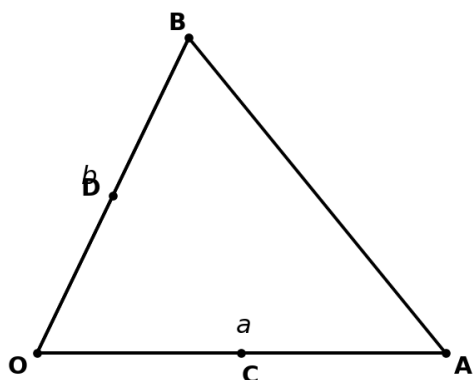
(c) Use your graph to estimate the median height.

----- (1)

(Total for Question 24 is 4 marks)

DO NOT WRITE IN THIS AREA

25 OAB is a triangle. $OA = a$ and $OB = b$.
 C is the midpoint of OA. D is the midpoint of OB.
 Diagram not drawn accurately



(a) Write OC in terms of a .

----- (1)

(b) Write CD in terms of a and b . Give your answer in its simplest form.

----- (2)

DO NOT WRITE IN THIS AREA

(c) Hence write down the relationship between the vectors $\overrightarrow{CD}$ and $\overrightarrow{AB}$.

----- (1)

(Total for Question 25 is 4 marks)

26 n is a positive integer.

Prove that the product of two consecutive even numbers is always a multiple of 8.

(Total for Question 26 is 3 marks)

DO NOT WRITE IN THIS AREA

27 $f(x) = 2x - 3$ and $g(x) = x^2 + 1$.

(a) Show that $gf(x) = 4x^2 - 12x + 10$.

----- (2)

(b) Solve $gf(x) = 26$.

----- (2)

(Total for Question 27 is 4 marks)

END OF QUESTIONS

DO NOT WRITE IN THIS AREA