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AQA-style GCSE (9–1) Mathematics practice paper

Paper 3 (Calculator)

Higher tier

Surname	
Other names	
Centre number	Candidate number

Time allowed	1 hour 30 minutes
Total marks	80
Materials	pen, pencil, ruler, protractor and compasses, a scientific calculator. A formulae sheet is supplied at the end of this paper.
Calculator	You may use a calculator.

Instructions

• Write in black ink or ball-point pen.
• Answer all questions in the spaces provided. Do not write outside the answer spaces.
• Show clearly how you work out each answer: you may get marks for your method even if the answer is wrong.
• Do all rough work on this paper and cross it out neatly.
• Diagrams are not accurately drawn unless a question says so.

Information

• The marks for each question are shown in square brackets, like this: [2 marks].
• The maximum mark for this paper is 80.
• The questions generally get harder as you work through the paper.

Advice

• Read each question carefully, keep an eye on the time and try to answer every question. Check your work if you have time at the end.

This is a JRA Tutors practice paper written in the style of the AQA GCSE Mathematics papers. It is not an official past paper, a prediction of the real 2027 paper, or produced or endorsed by AQA.

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1 Write $4^5 \times 4^4$ as a single power of 4. **[1 mark]**

Answer _____

2 Write 126 as a product of its prime factors. **[2 marks]**

Answer _____

3 Work out $2x^2$ when $x = -5$. **[2 marks]**

Answer _____

4 A fair dice is rolled 150 times. How many sixes would you expect? **[2 marks]**

Answer _____

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12 Write 0.181818... (the digits 18 recur) as a fraction in its simplest form. **[4 marks]**

Answer _____

13 **(a)** Describe the shape of the graph of $y = x^3$. **[2 marks]**

Answer _____

(b) Does the graph of $y = 8/x$ cross the y-axis? Explain. **[2 marks]**

Answer _____

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Mark scheme

AQA-style Practice Paper 3 · Higher

Award marks for correct answers. Where a question asks for working, award method marks for a correct method even if the final answer is wrong. Accept equivalent forms of the answer. Marks are shown per part; the total is 80.

Q	Answer	Marks	Working / guidance
1	**4^9**	1	Add the powers: 5+4
2	**$2 \times 3^2 \times 7$**	2	Use a factor tree or repeated division by primes.
3	**50**	2	Use brackets around negative numbers when substituting.
4	**25**	2	150 × 1/6
5	**12**	2	Read the numbers from the correct regions.
6	**9/25**	3	Multiply along the branches and add the relevant outcomes.
7	**3.22**	3	Mean = total pets ÷ total students.
8	**An outlier; it can be ignored when drawing the line**	3	It does not follow the trend.
9	**$-2 < x < 4$**	3	Where the curve is below the x-axis.
10	**See working**	3	x/y = 5/6; cross-multiply
11	**(4, 7/2)**	3	Average the coordinates.
12	**2/11**	4	Let x = 0.1818…; 100x − x = 18, so 99x = 18.
13(a)	**An S-shaped curve passing through the origin**	2	Cubic graph
13(b)	**No: x = 0 would mean dividing by zero**	2	The y-axis is an asymptote.
14	**150°**	4	angle = arc ÷ (2π r) × 360
15	**1.1576**	4	1.05^3
16	**−1/3**	5	Negative reciprocal of AB's gradient.
17	**[]**	5	Expand both sides
18	**39.7°**	5	sin x ÷ 10 = sin 50° ÷ 12
19	**5√5 cm**	5	√(25 + 100) = √125
20	**2.6**	5	Iterate until the values stabilise
21	**31.3 cm²**	6	Cosine rule for an angle, then ½ab sin C
22(a)	**Distance travelled**	2	Velocity × time.
22(b)	**48 m**	4	Triangle

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