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1MA1 Nov 2026 Paper 3H
Normal Higher · Mark Scheme

Disclaimer

This independent Best Guess practice resource prepares students for Pearson Edexcel GCSE Mathematics 1MA1 Higher Tier Paper 3 (calculator). It covers accessible and challenging Higher questions, not just one target grade.

This is not an official Pearson Edexcel paper or a guarantee of the questions that will appear. Revise the full specification.

Attempt all 20 questions, show your working, then use the matching mark scheme, worked solutions and available worksheets and clips at www.mygrade9mathstutor.com.

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Walkthrough playlist

Calculator allowed · 20 questions · 80 marks · Suggested time: 1 hour 30 minutes.
Answer every question. Give appropriate units and show all stages of your working.

Question 1 · 4 marks

Q / part	Working / method	Answer	Marks	Marking guidance
1(a)	The scale is 1 : 200. Model length = 78 ÷ 200 = 0.39 metres. Convert metres to centimetres: 0.39 × 100 = 39 cm.	**39 cm**	**3**	**M1** — Divide 78 by 200. **M1** — Convert metres to centimetres. **A1** — 39 cm.
1(b)	Any non-zero number raised to the power zero is 1, so 7^0 = 1.	**1**	**1**	**B1** — Correct value 1.

Question 2 · 3 marks

Q / part	Working / method	Answer	Marks	Marking guidance
2	(10 + q)/2 = 11, so q = 12 Mode = 19, so r = 19 19 – p = 16, so p = 3	**p = 3** **q = 12** **r = 19**	**3**	**B1** — For q = 12. **B1** — For r = 19. **B1** — For p = 3.

Q2 clip

Practice worksheet

Question 3 · 2 marks

Q / part	Working / method	Answer	Marks	Marking guidance
3(a)	1.6 + 0.05	**1.65 m**	**1**	**B1** — Correct upper bound.
3(b)	1.6 – 0.05	**1.55 m**	**1**	**B1** — Correct lower bound.

Q3 clip

Practice worksheet

Question 4 · 7 marks

Q / part	Working / method	Answer	Marks	Marking guidance
4(a)	$x^2 + 7x - 4x - 28$	**$x^2 + 3x - 28$**	**2**	**M1** — Multiply out the two brackets. **A1** — Correct simplified quadratic.
4(b)	Highest common factor: $6cw^2$	**$6cw^2(3c^4 + 5w)$**	**2**	**M1** — Identify the highest common factor. **A1** — Correct fully factorised form.
4(c)	$7x - 2 = 4(3x + 1)$ $7x - 2 = 12x + 4$ $-5x = 6$	**$x = -1.2$**	**3**	**M1** — Multiply both sides by 4 and expand. **M1** — Collect variable and constant terms. **A1** — -1.2 or $-6/5$.

Q5(a) clip

Practice worksheet

Q5(b) clip

Practice worksheet

Q5(c) clip

Practice worksheet

Question 5 · 2 marks

Q / part	Working / method	Answer	Marks	Marking guidance
5	075° + 180°	**255°**	**2**	**M1** — Reverse the direction by adding 180°. **A1** — Correct bearing.

Q6 clip

Practice worksheet

Question 6 · 3 marks

Q / part	Working / method	Answer	Marks	Marking guidance
6	$V = \pi r^2 h = \pi \times 4.5^2 \times 10$ $V = 636.172\ldots$	**636 cm³**	**3**	**M1** — Use the cylinder volume formula with correct values. **M1** — Correct numerical evaluation, before rounding. **A1** — 636 cm³ to 3 significant figures.

Q7 clip

Practice worksheet

Question 7 · 5 marks

Q / part	Working / method	Answer	Marks	Marking guidance
7	600 × 1.15 = 690 euros 3 + 2 = 5 parts 690 × 2/5 = 276 euros 276 ÷ 1.18 = 233.898…	**£233.90**	**5**	**M1** — Convert £600 to €690. **M1** — Use saving fraction 2/(3+2) = 2/5. **M1** — Obtain savings of €276. **M1** — Divide savings by the new exchange rate 1.18. **A1** — Correct final amount to the nearest penny.

Q4 clip

Practice worksheet

Question 8 · 3 marks

Q / part	Working / method	Answer	Marks	Marking guidance
8	135 km = 135000 m 1 h 30 min = 5400 s 135000 ÷ 5400	**25 m/s**	**3**	**M1** — Convert both distance and time into the required units. **M1** — Divide distance by time. **A1** — Correct speed.

Q8 clip

Practice worksheet

Question 9 · 4 marks

Q / part	Working / method	Answer	Marks	Marking guidance
9	54 ÷ 0.45 = 120 counters P(blue or yellow) = 0.4 120 × 0.4 = 48 48 × 3/8 = 18	**18 blue counters**	**4**	**M1** — Find the total of 120 counters. **M1** — Find remaining probability 0.4 or remaining count 48. **M1** — Use blue fraction 3/8 of the remaining counters. **A1** — 18 blue counters.

Q9 clip

Practice worksheet

Question 10 · 5 marks

Q / part	Working / method	Answer	Marks	Marking guidance
10(a)	$5^0 = 1$	**k = 0**	**1**	**B1** — For k = 0.
10(b)	$27/3^8 = 3^3/3^8 = 3^{-5}$	**m = –5**	**2**	**M1** — For writing 27 as 3 cubed and applying the quotient law. **A1** — For m = –5.
10(c)	$(7^{-4})^3 \times 7^5 = 7^{-12} \times 7^5 = 7^{-7}$	**p = –7**	**2**	**M1** — For multiplying the indices –4 × 3 and adding 5. **A1** — For p = –7.

Q11 clip

Practice worksheet

Question 11 · 4 marks

Q / part	Working / method	Answer	Marks	Marking guidance
11	85000 × 0.88 × 0.85 = 63580 63580(1 + x/100) = 66759 66759 ÷ 63580 = 1.05	**x = 5**	**4**	**M1** — Apply both depreciation multipliers. **M1** — Set up the third-year percentage multiplier. **M1** — Find the third-year multiplier 1.05. **A1** — 5% increase.

Q12 clip

Practice worksheet

Question 12 · 4 marks

Q / part	Working / method	Answer	Marks	Marking guidance
12	Interior angle = 180 – 360/11 = 147.2727…° BCDE is an isosceles trapezium. ∠DEB = (360 – 2 × 147.2727…)/2 = 32.7272…° ∠BEF = 147.2727… – 32.7272…	**114.5°**	**4**	**M1** — Find a regular polygon interior angle. **M1** — Use the equal base angles in isosceles trapezium BCDE. **M1** — Subtract angle DEB from the full interior angle at E. **A1** — 114.5° to one decimal place; accept another valid method.

Q13 clip

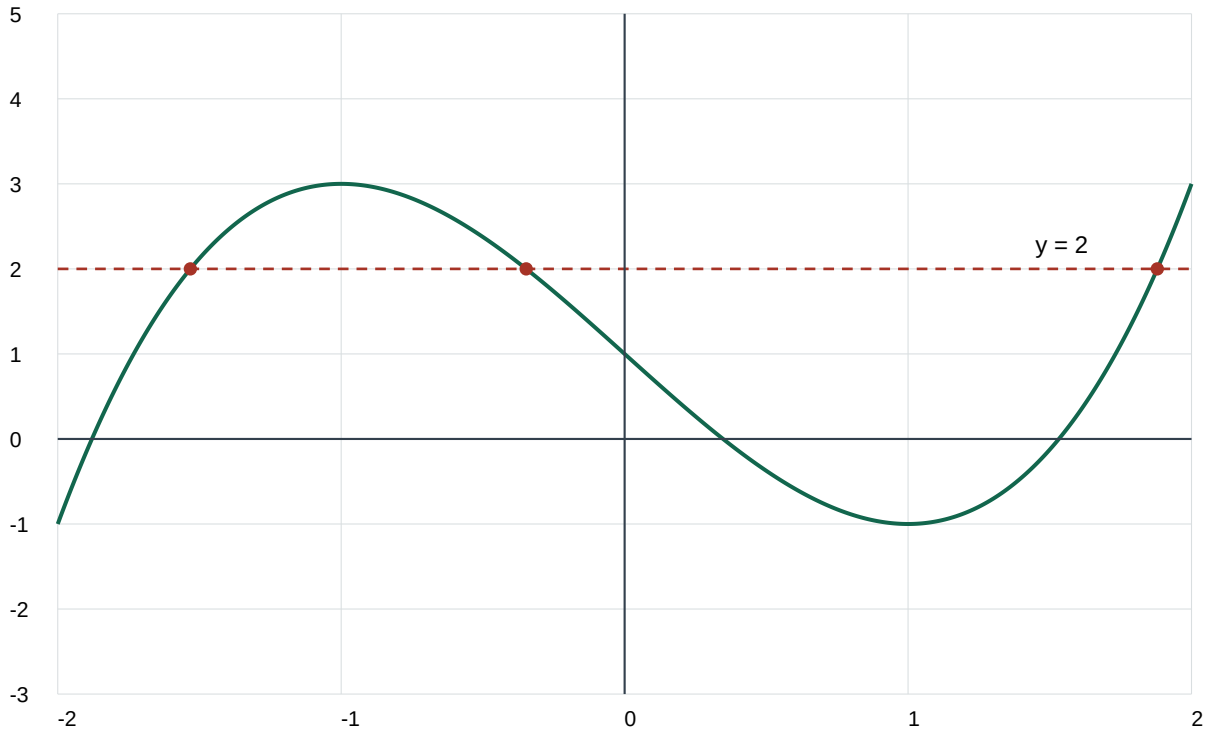
Practice worksheet

Question 13 · 3 marks

Q / part	Working / method	Answer	Marks	Marking guidance
13	The first digit is 5, 6, 7 or 8. The final digit must be even. If the first digit is 5 or 7, there are 2 × 4 × 6 × 5 = 240 codes. If the first digit is 6 or 8, only three even digits remain for the last position: 2 × 3 × 6 × 5 = 180 codes. Add the disjoint cases: 240 + 180 = 420.	**420**	**3**	**M1** — Account for the restriction on both first and final digits. **M1** — Handle the no-repetition restriction and distinguish odd/even first digits. **A1** — Correct total 420.

Question 14 · 6 marks

Q / part	Working / method	Answer	Marks	Marking guidance
14(a)	Missing entries, from left to right.	**–1, 1, 3**	**2**	**B1** — At least two of the three missing entries correct. **B1** — All three missing entries correct.
14(b)	Smooth cubic through the completed table points.	**Graph of $y = x^3 – 3x + 1$**	**2**	**M1** — Accurately plot table values. **A1** — Smooth curve with correct turning-point shape.
14(c)	Draw y = 2; read the three intersections.	**$x \approx –1.5, –0.3, 1.9$**	**2**	**M1** — Suitable straight line y = 2. **A1** — A correctly read solution to 1 decimal place. Accept readings consistent with the drawn curve, within 0.1 of –1.532…, –0.347… or 1.879…. All three are shown for completeness.



Intersections give x = -1.5, -0.3, 1.9 (1 decimal place).

Q14 clip

Practice worksheet

Question 15 · 4 marks

Q / part	Working / method	Answer	Marks	Marking guidance
15(a)	$2(x^2 - 6x) + 23$ $2[(x - 3)^2 - 9] + 23$	**$2(x - 3)^2 + 5$**	**3**	**M1** — Factor 2 from the quadratic and linear terms. **M1** — Complete the square correctly, accounting for the outer 2. **A1** — Correct completed-square form.
15(b)	Read the minimum from $2(x - 3)^2 + 5$.	**(3, 5)**	**1**	**B1** — Correct turning point.

Q19 clip

Practice worksheet

Question 16 · 3 marks

Q / part	Working / method	Answer	Marks	Marking guidance
16	$4050 = 5000k^2$. $k^2 = 0.81$; $k = \sqrt{0.81}$.	**$k = 0.9$**	**3**	**M1** — Use two annual multiplications. **M1** — Find $k^2 = 4050/5000$. **A1** — Positive multiplier 0.9.

Q20 clip

Practice worksheet

Question 17 · 5 marks

Q / part	Working / method	Answer	Marks	Marking guidance
17(a)	HM = 5 cm $VM^2 = 15^2 + 5^2 = 250$	**VM = 15.8 cm**	**3**	**M1** — Find half the base side. **M1** — Use Pythagoras in triangle VHM. **A1** — 15.8 cm to 3 significant figures.
17(b)	$\tan \theta = VH/HM = 15/5 = 3$	**71.6°**	**2**	**M1** — Use the angle VMH between the face and base. **A1** — 71.6° to one decimal place.

Q17 clip

Practice worksheet

Question 18 · 4 marks

Q / part	Working / method	Answer	Marks	Marking guidance
18(a)	Total frequency: a + b = 160 – 30 – 60 = 70. Histogram height is proportional to frequency density. The densities are a/5 and b/15. The given height ratio gives a/5 = 2b/15, so 3a = 2b. Substitute b = 70 – a: 3a = 140 – 2a, hence a = 28 and b = 42. Check: the first density is 30/10 = 3, represented by 6 cm, so the height scale is 2 cm per density unit.	**a = 28, b = 42**	**3**	**M1** — Use a + b = 70. **M1** — Relate the correct class densities, not the frequencies. **A1** — Both missing frequencies correct.
18(b)	Cumulative frequencies: 30, 58, 118, 160. The 80th value is in $15 < w \leq 25$.	$15 < w \leq 25$	1	B1 — Correct class interval $15 < w \leq 25$.

Question 19 · 4 marks

Q / part	Working / method	Answer	Marks	Marking guidance
19	Let two consecutive odd integers be 2n + 1 and 2n + 3, where $n \in \mathbb{Z}$. $(2n + 3)^2 – (2n + 1)^2 = (4n^2 + 12n + 9) – (4n^2 + 4n + 1)$ $= 8n + 8 = 8(n + 1)$. Because n + 1 is an integer, the difference is a multiple of 8. Reversing the subtraction changes the sign, but it is still a multiple of 8.	**8(n + 1), hence a multiple of 8**	**4**	**B1** — Represent consecutive odd integers algebraically. **M1** — Expand and subtract, or use a valid difference-of-squares method. **A1** — Correct factorisation as 8 times an integer expression. **B1** — Conclude why the expression is always a multiple of 8.

Question 20 · 5 marks

Q / part	Working / method	Answer	Marks	Marking guidance
20	The removed cone has volume fraction 1 – 19/27 = 8/27 of the original. The cones are similar, so the linear scale factor is $\sqrt[3]{(8/27)} = 2/3$. Surface areas scale with the square of the linear factor: $(2/3)^2 = 4/9$. The smaller cone's total surface area is $540\pi \times 4/9 = 240\pi$ cm².	**240π cm²**	**5**	**M1** — Find the smaller cone volume fraction 8/27. **M1** — Take a cube root to find the linear factor. **A1** — Correct linear factor 2/3. **M1** — Square the factor and apply to the original total surface area. **A1** — Correct exact area.