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1MA1 Nov 2026 Paper 1 Best Guess Paper

Higher · Standard · Worked Solutions

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This independently compiled practice paper is designed for students preparing for the Pearson Edexcel GCSE Mathematics 1MA1 Higher Tier, Paper 1 (non-calculator). It includes a range of accessible and challenging Higher Tier questions for standard exam practice, rather than focusing only on a particular target grade.

It is not an official Pearson Edexcel examination paper and is not endorsed by Pearson. The selection draws on previous exam-style material to support revision. There is no guarantee that these questions or topics will appear in the real examination. Claims of a perfectly predicted paper should not be relied on.

The best preparation is to revise the full specification. Attempt the paper, use the mark scheme and worked solutions to review your work, and practise related topics with the free worksheets and clips at www.mygrade9mathstutor.com.

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Video walkthrough

Non-calculator · 22 questions · 80 marks · Suggested time: 1 hour 30 minutes.
Attempt every question. Show your working, then review the mark scheme and worked solutions.

Paper 1H · Standard Higher · Worked Solutions

GCSE Mathematics 1MA1 · November 2026 · Non-calculator · 22 questions · 80 marks

Question 1 · Division of Mixed Fractions · 3 marks

Convert the mixed number: 2¼ = 9/4.

Dividing by 3/5 means multiplying by its reciprocal: (9/4) × (5/3) = 45/12.

Simplify by dividing numerator and denominator by 3: 45/12 = 15/4 = 3¾.

Answer: 3¾

Question 2 · Ratio Sharing · 2 marks

Alex : Ben : Chloe = 2 : 5 : 9. Chloe has 9 – 2 = 7 more ratio parts than Alex.

Those 7 parts are worth £35, so one part is £35 ÷ 7 = £5.

Ben has 5 parts: 5 × £5 = £25.

Answer: £25

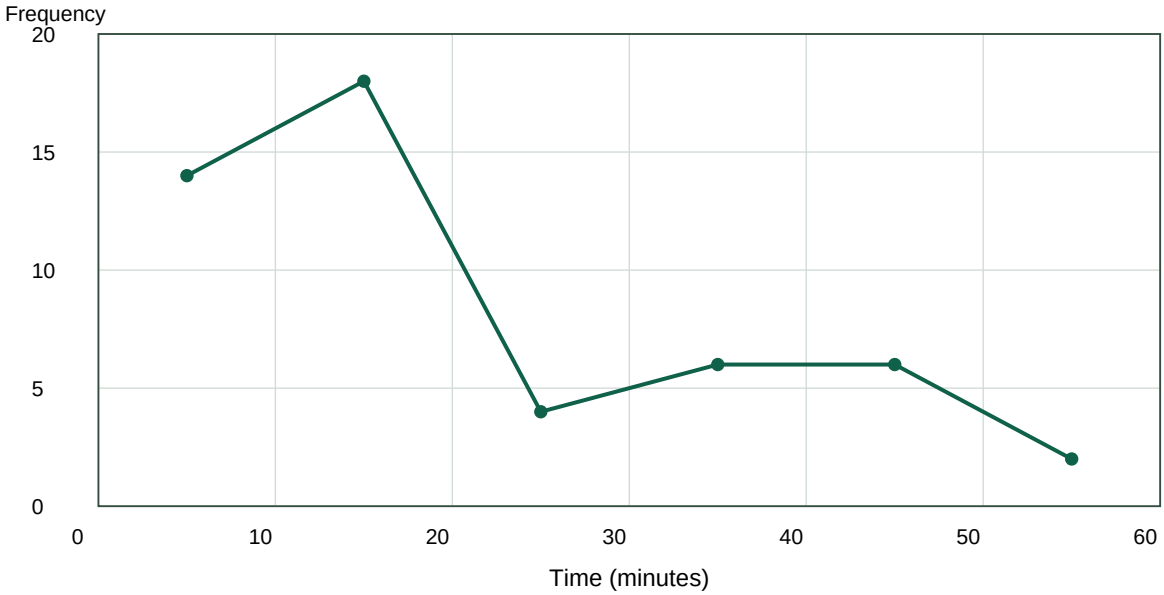
Question 3 · Frequency Polygon and Modal Class · 3 marks

(a) For a frequency polygon, plot the frequency at each class midpoint. The midpoints are 5, 15, 25, 35, 45 and 55 minutes.

Plot (5,14), (15,18), (25,4), (35,6), (45,6), (55,2). Join consecutive points with straight lines, as shown.

(b) The largest frequency is 18, belonging to the interval 10 < t ≤ 20.

Answer: (a) See polygon; (b) 10 < t ≤ 20



Paper 1H · Standard Higher · Worked Solutions

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Question 4 · Index Laws and Quadratic Factorising · 5 marks

(a) Multiplying powers with the same base adds their indices: $a^6 \times a^{10} = a^{16}$.

(b) Dividing powers with the same base subtracts their indices: $c^{30} \div c^{12} = c^{18}$.

(c)(i) Find two numbers whose product is 24 and whose sum is –10: –4 and –6. Thus $x^2 - 10x + 24 = (x - 4)(x - 6)$.

(c)(ii) $(x - 4)(x - 6) = 0$, so $x - 4 = 0$ or $x - 6 = 0$.

Answer: (a) a^{16}; (b) c^{18}; (c)(i) $(x - 4)(x - 6)$; (ii) $x = 4$ or 6

Question 5 · Error Intervals · 2 marks

The rounded value is 0.046 to two significant figures. Its last significant digit is in the thousandths place, so the rounding step is 0.001.

Half of this step is 0.0005. Lower boundary: 0.046 – 0.0005 = 0.0455. Upper boundary: 0.046 + 0.0005 = 0.0465.

Include the lower boundary and exclude the upper boundary: the upper value would round to 0.047.

Answer: $0.0455 \leq y < 0.0465$

Question 6 · Sets and Probability · 4 marks

The universal set is {1,2,3,4,5,6,7,8,9,10,11,12}. A = {1,2,3,4,6,12} and B = {3,6,9,12}.

(a) A ∩ B contains only numbers in both sets: {3,6,12}.

(b) A ∪ B contains numbers in either set, without counting repeats: {1,2,3,4,6,9,12}.

There are 7 favourable numbers out of 12 equally likely numbers. Probability = 7/12.

Answer: (a) {3,6,12}; (b) 7/12

Question 7 · Recurring Decimals · 3 marks

Let x = 0.38181818… . The recurring block is 81; the initial 3 does not recur.

Multiply by 10: 10x = 3.8181818… . Multiply by 1000: 1000x = 381.8181818… .

Subtract the equations; the identical recurring tails cancel: 1000x – 10x = 381 – 3.

Thus 990x = 378, so x = 378/990. Divide numerator and denominator by 18 to get 21/55.

Answer: 0.38181818… = 21/55

Question 8 · Expanding Triple Brackets · 3 marks

Expand the first two brackets: $(x - 2)(x + 3) = x^2 + x - 6$.

Multiply by the third bracket: $(x^2 + x - 6)(2x + 1) = 2x^3 + x^2 + 2x^2 + x - 12x - 6$.

Collect like terms: $2x^3 + 3x^2 - 11x - 6$.

Answer: $2x^3 + 3x^2 - 11x - 6$

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Question 9 · Exact Length of a Line Segment · 3 marks

The horizontal difference between the points is 8 and the vertical difference is −6.

These form the perpendicular sides of a right-angled triangle. By Pythagoras, length^2 = 8^2 + $(-6)^2$ = 64 + 36 = 100.

Take the positive square root: length = $\sqrt{100}$ = 10. This is exact; no decimal approximation is needed.

Answer: 10

Question 10 · Standard Form · 3 marks

(a) 0.0000407 = 4.07×10^{-5}. The coefficient must be at least 1 and less than 10.

(b) $(3.2 \times 10^4)(5 \times 10^3) = (3.2 \times 5) \times 10^{4+3} = 16 \times 10^7$.

Write 16 as 1.6×10, giving 1.6×10^8.

Answer: (a) 4.07×10^{-5}; (b) 1.6×10^8

Question 11 · Density of Mixed Liquids · 3 marks

Mass = density × volume. Liquid A: 1.2 × 300 = 360 g. Liquid B: 0.8 × 200 = 160 g.

Total mass = 360 + 160 = 520 g. Total volume = 300 + 200 = 500 cm^3.

Density of the mixture = total mass ÷ total volume = 520/500 = 1.04 g/cm^3. Do not simply average the two densities because their volumes differ.

Answer: 1.04 g/cm^3

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Question 12 · Cumulative Frequency · 8 marks

(a) Add frequencies successively: 8; 8 + 15 = 23; 23 + 37 = 60; 60 + 10 = 70; 70 + 7 = 77; 77 + 3 = 80.

(b) Plot cumulative frequency at upper boundaries: (200,8), (300,23), (400,60), (500,70), (600,77), (700,80). Start at (100,0) and join with a smooth increasing curve.

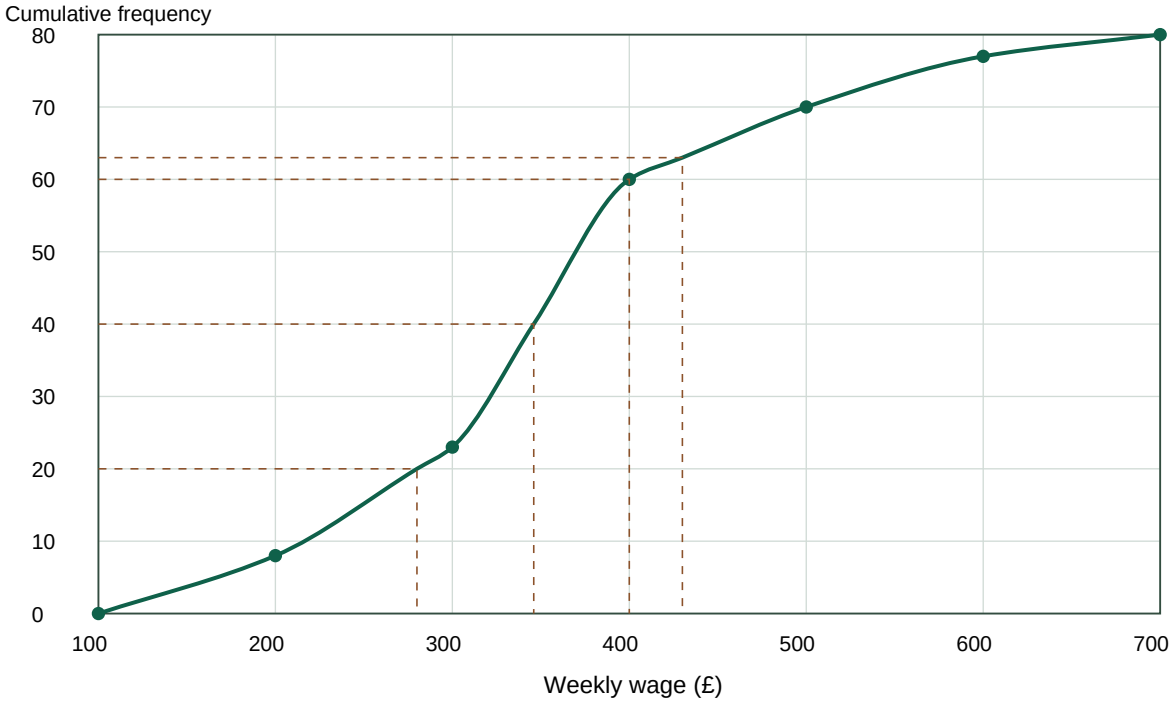
(c) There are 80 workers, so the median is at cumulative frequency 40. Read across to the curve and down to the wage axis: approximately £346.

(d) Lower quartile: CF = 80/4 = 20, giving about £280. Upper quartile: CF = 3 × 80/4 = 60, giving £400. IQR ≈ £400 – £280 = £120.

(e) At £430, CF ≈ 63. This counts wages up to £430. Wages above £430: 80 – 63 ≈ 17 workers.

Graph answers are estimates. Small variations are acceptable when they are consistent with a correctly drawn curve.

Answer: (a) 8,23,60,70,77,80; (c) ≈ £346; (d) ≈ £120; (e) ≈ 17 workers



Question 13 · Quadratic Inequalities · 3 marks

Start with $3x^2 – 5 \leq 14x$. Move all terms to the left: $3x^2 – 14x – 5 \leq 0$.

Factorise: $3x^2 – 14x – 5 = (3x + 1)(x – 5)$. The boundary values are $x = –1/3$ and $x = 5$.

The coefficient of x^2 is positive, so the quadratic is zero or negative between its roots. Include both roots because the inequality is ≤.

Answer: $–1/3 \leq x \leq 5$

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Question 14 · Combined Proportion · 4 marks

y is directly proportional to t^2, so $y = kt^2$. Use $y = 20$ when $t = 2$: $20 = 4k$, hence $k = 5$ and $y = 5t^2$.

t is inversely proportional to $\sqrt{x}$, so $t = c/\sqrt{x}$. Use $t = 3$ when $x = 4$: $3 = c/2$, hence $c = 6$.

Substitute $t = 6/\sqrt{x}$ into $y = 5t^2$: $y = 5(6/\sqrt{x})^2 = 5 \times 36/x = 180/x$.

Answer: $y = 180/x$

Question 15 · Simplifying Algebraic Fractions · 3 marks

Factorise the numerator using the difference of two squares: $x^2 - 9 = (x - 3)(x + 3)$.

Factorise the denominator: $2x^2 + 5x - 3 = 2x^2 + 6x - x - 3 = (2x - 1)(x + 3)$.

Cancel the common factor $x + 3$: $[(x - 3)(x + 3)]/[(2x - 1)(x + 3)] = (x - 3)/(2x - 1)$.

The original denominator excludes $x = -3$ and $x = 1/2$.

Answer: $(x - 3)/(2x - 1)$

Question 16 · Circle Theorems · 3 marks

The angle BAC is 35°. Both ∠BAC and ∠BDC subtend the same chord BC from the same segment of the circle.

Angles in the same segment are equal. Therefore ∠BDC = ∠BAC = 35°.

This direct circle-theorem method is sufficient; the diameter AC does not need to be used.

Answer: 35°, because angles in the same segment are equal

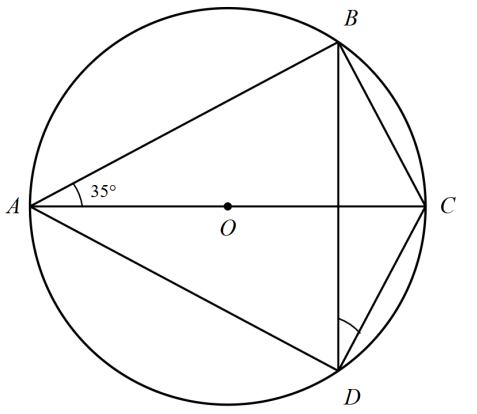


Diagram NOT accurately drawn

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Question 17 · Inverse and Composite Functions · 6 marks

(a) Let $y = (2x + 1)/(x – 3)$. Multiply by $x – 3$: $xy – 3y = 2x + 1$.

Collect the terms containing x: $xy – 2x = 3y + 1$, so $x(y – 2) = 3y + 1$ and $x = (3y + 1)/(y – 2)$.

Replace the input letter y by x: $f^{-1}(x) = (3x + 1)/(x – 2)$, $x \neq 2$.

(b) gf(x) means g(f(x)), so $gf(x) = [(2x + 1)/(x – 3)]^2 – 4$.

Use denominator $(x – 3)^2$: numerator $= (2x + 1)^2 – 4(x – 3)^2 = (4x^2 + 4x + 1) – (4x^2 – 24x + 36) = 28x – 35$.

Thus $gf(x) = (28x – 35)/(x – 3)^2$, $x \neq 3$.

(c) $g(x) = 21$ gives $x^2 – 4 = 21$, so $x^2 = 25$ and $x = \pm 5$.

Answer: (a) $(3x + 1)/(x – 2)$; (b) $(28x – 35)/(x – 3)^2$; (c) $x = \pm 5$

Question 18 · Rearranging a Formula · 3 marks

Square both sides: $p^2 = (2y + 5)/(3y – k)$.

Multiply by $3y – k$: $p^2(3y – k) = 2y + 5$. Expand: $3p^2y – p^2k = 2y + 5$.

Collect the y terms: $3p^2y – 2y = p^2k + 5$. Factor: $y(3p^2 – 2) = p^2k + 5$.

Divide by $3p^2 – 2$ to make y the subject.

Answer: $y = (p^2k + 5)/(3p^2 – 2)$

Question 19 · Non-linear Simultaneous Equations · 5 marks

The line gives $y = 7 – 2x$. Substitute into the curve: $x^2 + (7 – 2x)^2 – 4x + 2(7 – 2x) = 32$.

Expand: $x^2 + 49 – 28x + 4x^2 – 4x + 14 – 4x = 32$.

Collect terms and subtract 32: $5x^2 – 36x + 31 = 0$. Factorise: $(5x – 31)(x – 1) = 0$.

Hence $x = 31/5$ or $x = 1$. For $x = 1$, $y = 7 – 2 = 5$. For $x = 31/5$, $y = 35/5 – 62/5 = –27/5$.

Keep x and y paired: the two intersection points are (1,5) and (31/5,–27/5).

Answer: (1,5) and (31/5,–27/5)

Question 20 · Completing the Square · 3 marks

Factor 3 out of the x terms: $y = 3(x^2 – 4x) + 7$.

Complete the square: $x^2 – 4x = (x – 2)^2 – 4$.

Therefore $y = 3[(x – 2)^2 – 4] + 7 = 3(x – 2)^2 – 5$.

The squared term is smallest at $x = 2$, when $y = –5$. The turning point is the minimum (2,–5).

Answer: (2,–5)

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Question 21 · Rationalising a Surd Denominator · 4 marks

Expand the numerator: $(2 + \sqrt{3})^2 = 4 + 4\sqrt{3} + 3 = 7 + 4\sqrt{3}$.

Rationalise by multiplying top and bottom by $2 + \sqrt{3}$, the conjugate of $2 - \sqrt{3}$.

Denominator: $(2 - \sqrt{3})(2 + \sqrt{3}) = 4 - 3 = 1$.

Numerator: $(7 + 4\sqrt{3})(2 + \sqrt{3}) = 14 + 7\sqrt{3} + 8\sqrt{3} + 12 = 26 + 15\sqrt{3}$.

Divide by 1. The required integers are $a = 26$ and $b = 15$.

Answer: $26 + 15\sqrt{3}$

Question 22 · Transforming Function Graphs · 4 marks

The original turning point is $(-2,5)$.

(a) In $y = -f(x + 3)$, $x + 3$ shifts the graph 3 units left: $(-2,5) \rightarrow (-5,5)$. The outside minus reflects in the x-axis: $(-5,5) \rightarrow (-5,-5)$.

The mapped turning-point coordinates are $(-5,-5)$.

(b) Start again from the original point $(-2,5)$. In $y = f(-x) + 3$, reflect in the y-axis: $(-2,5) \rightarrow (2,5)$.

Translate 3 units up: $(2,5) \rightarrow (2,8)$.

Answer: (a) $(-5,-5)$; (b) $(2,8)$