

Mark Scheme

Summer 2027 (Predicted)

GCSE Mathematics (Edexcel-style 1MA1)

Higher (Non-Calculator) Paper 1

This is an original mark scheme written for a predicted practice paper. It is NOT an official Edexcel mark scheme and is NOT endorsed by or affiliated with Pearson Edexcel.

For use with the Predicted Practice Paper 1 question paper.

General marking guidance

These notes offer general guidance, but the specific notes for examiners appertaining to individual questions take precedence.

1 All candidates must receive the same treatment.

Mark the last script in exactly the same way as the first.

2 Mark positively.

The mark scheme is designed so that every mark can be awarded. Give credit for what is correct, and award zero only when a response deserves no credit. If the answer line is wrong or blank, always check the working and any diagrams first.

3 Working not required / working required.

Where working is not required, a correct answer alone earns full marks. Where a question specifically requires working (for example “show that” or a proof), a candidate who shows no working earns no marks.

4 Crossed-out work.

Mark crossed-out work unless the candidate has replaced it with a new response.

5 Choice of method.

Where several methods are shown, mark the method that leads to the answer given on the answer line. If there is no answer on the line, mark every method shown and award the lower total.

6 Incorrect method.

If the working clearly produces a “correct” answer by an incorrect method, award no marks.

7 Follow-through marks.

A follow-through mark involving a single calculation step can be awarded from the answer alone. One involving more than one step can only be awarded if the relevant working is seen, even when there seems to be only one possible route to the answer.

8 Ignoring subsequent work.

Ignore extra work that does not spoil a correct answer (for example an incorrectly cancelled fraction where the uncanceled form would earn full marks). Do not ignore extra work that makes the answer incorrect.

9 Probability.

Give probabilities as a fraction, percentage or decimal. A decimal equivalent should have at least 2 decimal places. Penalise poor notation on the accuracy mark only, keeping any method marks.

10 Linear equations.

Full marks can be given for the solution alone on the answer line (or clearly shown in working). If the solution is only shown substituted back into the equation, the accuracy mark is lost but method marks can still be awarded.

11 Range of answers.

A range such as 3.5 – 4.2 includes both end points and every value between them.

12 Number in brackets after a calculation.

Where a bracketed value follows a calculation, for example $2 \times 6 (= 12)$, the mark can be given either for the correct method or for the correct bracketed answer.

13 Word in square brackets.

Where a word appears in square brackets, for example $[\text{area}] \times 1.5$, the value used for $[\text{area}]$ does not need to come from correct working — use the candidate's value, subject to any limits stated in the mark scheme.

14 Misread.

If a candidate misreads a number from the question (for example 252 for 255), method marks can still be awarded provided the question has not been made easier.

Paper: 1MA1/1H				
Question	Answer	Mark	Mark scheme	Additional guidance
1	9/20	B1	9/20	AO1
2	1 4/15	M1 A1 A1	Common denominator of 15: 9/15 + 10/15; 19/15; 1 4/15	AO1
3	$2^4 \times 3 \times 5$	M1 A1	Correct factor tree/ladder method; $2^4 \times 3 \times 5$	AO1
4	4	M1 A1	$2^7 \div 2^5$ or 2^2 seen; 4	AO1
5	4×10^9	M1 A1	$(8 \div 2) \times 10^{6-(-3)}$ or 4×10^9 seen; 4×10^9	AO1
6(a)	8.45	B1	8.45	AO1
6(b)	44.3625	M1 A1	8.45×5.25 ; 44.3625	AO2
6(c)	43.0025	B1	43.0025	AO2
7(a)	12	M1 A1	Correct method (factor trees / listing); 12	AO1
7(b)	3/5	B1	3/5	AO1; follow through: $36 \div$ their HCF over $60 \div$ their HCF
8(a)	2/3	M1 A1	Let $x = 0.666\dots$, $10x = 6.666\dots$, subtract; 2/3	AO2
8(b)	3/11	B1	3/11	AO2
9	$x = 8$	M1 A1	$5x = 40$; $x = 8$	AO1
10	$5x + 2$	M1 A1	$3x + 12 + 2x - 10$ or $5x + 2$ seen; $5x + 2$	AO1
11	$t = (v - u)/a$	M1 A1 A1	$v - u = at$; $t = (v - u)/a$; fully correct with brackets	AO1
12	$n^2 + 2n$	M1 M1 A1	Second difference of 2 identified (so n^2 term); difference from n^2 is $2n$; $n^2 + 2n$	AO2
13	$x = 4$, $y = 3$	M1 A1 A1	Eliminate one variable (add equations); $x = 4$; $y = 3$	AO2
14	$x = 1/2$, $x = -4$	M1 A1 A1 A1	Factorise to $(2x - 1)(x + 4)$; $x = 1/2$; $x = -4$	AO1
15(a)	$4\sqrt{3}$	M1 A1	$\sqrt{27} = 3\sqrt{3}$ and $\sqrt{12} = 2\sqrt{3}$; $4\sqrt{3}$	AO1
15(b)	$2\sqrt{5}$	M1 A1	Multiply top and bottom by $\sqrt{5}$: $10\sqrt{5}/5$; $2\sqrt{5}$	AO1
16	$4(n + 1)$, with concluding statement	M1 A1 A1	$2n+1$ and $2n+3$ (or $2n-1$ and $2n+1$); sum = $4n + 4$; $4(n + 1)$, hence divisible by 4, with concluding statement	AO2
17	£24, £36, £60	M1 A1	$120 \div 10 = 12$; £24, £36, £60	AO1

Question	Answer	Mark	Mark scheme	Additional guidance
18	£92	M1 M1 A1	15% of 80 = 12 (or multiplier 1.15); 80 + 12; £92	AO1
19	£2121.80	M1 M1 A1 A1	Multiplier 1.03; 2000×1.03^2 ; $1.03^2 = 1.0609$; £2121.80	AO2
20	16	M1 A1 A1	$y = kx^2$; $k = 1$ from $36 = k \times 36$; $y = 16$	AO2
21	Pack B	M1 A1	Unit price for each pack: 0.3p/g and 0.275p/g (or £0.003/g and £0.00275/g); Pack B	AO3
22	$4\sqrt{3}$ cm	M1 A1 A1	$\cos 30^\circ = 6/AC$; $AC = 12/\sqrt{3}$; $4\sqrt{3}$ cm	AO2
23(a)	55°	M1 A1	Angle at centre is twice angle at circumference: $110 \div 2$; 55° , with reason stated	AO2
23(b)	55°	M1 A1	Angle in a semicircle is 90° , so angle $PRQ = 90^\circ$; $180 - 90 - 35 = 55^\circ$	AO2
24(a)	(8, -2)	M1 A1	$2a = (6, 2)$; (8, -2)	AO1
24(b)	$\sqrt{10}$	B1	$\sqrt{10}$	AO1
25(a)	1 cm^2	M1 A1	$(\sqrt{5} + 2)(\sqrt{5} - 2) = 5 - 4$; = 1, as required	AO2
25(b)	$4\sqrt{5}$ cm	M1 A1	$2(\sqrt{5} + 2 + \sqrt{5} - 2)$ or $2(\sqrt{5}+2) + 2(\sqrt{5}-2)$; = $4\sqrt{5}$, as required	AO2
26	13/28	M1 A1 A1 A1	$3/8 \times 2/7$ and $5/8 \times 4/7$; 6/56; 20/56; $26/56 = 13/28$	AO3
27(a)	20	B1	20	AO1
27(b)	1.5	M1 M1 A1	$(0 \times 4 + 1 \times 7 + 2 \times 5 + 3 \times 3 + 4 \times 1) = 30$; $30 \div 20$; 1.5	AO1

Worked solutions

- Q1.** $0.45 = 45/100$. Divide top and bottom by 5: $9/20$. Answer: $9/20$
- Q2.** Common denominator 15: $3/5 = 9/15$, $2/3 = 10/15$. Sum = $19/15 = 1 \frac{4}{15}$. Answer: $1 \frac{4}{15}$
- Q3.** $240 = 24 \times 10 = (2^3 \times 3) \times (2 \times 5) = 2^4 \times 3 \times 5$. Answer: $2^4 \times 3 \times 5$
- Q4.** $2^3 \times 2^4 = 2^7$. $2^7 \div 2^5 = 2^2 = 4$. Answer: 4
- Q5.** $(8 \div 2) \times 10^{6-(-3)} = 4 \times 10^9$. Answer: 4×10^9
- Q6.** (a) 8.4 measured to the nearest 0.1 $\rightarrow$ upper bound 8.45 cm. (b) Upper bound of width = 5.25 cm. Area = $8.45 \times 5.25 = 42.25 + 2.1125 = 44.3625 \text{ cm}^2$. (c) Lower bounds: $8.35 \times 5.15 = 41.75 + 1.2525 = 43.0025 \text{ cm}^2$.
- Q7.** (a) $36 = 2^2 \times 3^2$, $60 = 2^2 \times 3 \times 5$. Common factors: $2^2 \times 3 = 12$. HCF = 12. (b) Divide top and bottom by 12: $36/60 = 3/5$.
- Q8.** (a) Let $x = 0.666\dots$. Then $10x = 6.666\dots$. Subtract: $9x = 6 \rightarrow x = 6/9 = 2/3$. (b) Let $y = 0.272727\dots$. Then $100y = 27.2727\dots$. Subtract: $99y = 27 \rightarrow y = 27/99 = 3/11$.
- Q9.** $5x = 33 + 7 = 40 \rightarrow x = 8$. Answer: $x = 8$
- Q10.** $3(x + 4) = 3x + 12$; $2(x - 5) = 2x - 10$. Sum: $5x + 2$. Answer: $5x + 2$
- Q11.** $v = u + at \rightarrow v - u = at \rightarrow t = (v - u)/a$. Answer: $t = (v - u)/a$
- Q12.** Differences: 5, 7, 9 $\rightarrow$ second difference 2, so the n th term has an n^2 term. n^2 gives 1, 4, 9, 16; subtract from the sequence: 2, 4, 6, 8 = $2n$. Answer: $n^2 + 2n$
- Q13.** Add the equations (the $2y$ terms cancel): $4x = 16 \rightarrow x = 4$. Substitute into $x - 2y = -2$: $4 - 2y = -2 \rightarrow 2y = 6 \rightarrow y = 3$. Check: $3(4) + 2(3) = 18$. Answer: $x = 4$, $y = 3$
- Q14.** $2x^2 + 7x - 4 = (2x - 1)(x + 4) = 0 \rightarrow x = 1/2$ or $x = -4$. Answer: $x = 1/2$, $x = -4$
- Q15.** (a) $\sqrt{27} = \sqrt{9 \times 3} = 3\sqrt{3}$; $\sqrt{12} = \sqrt{4 \times 3} = 2\sqrt{3}$. So $2\sqrt{27} - \sqrt{12} = 6\sqrt{3} - 2\sqrt{3} = 4\sqrt{3}$. (b) $10/\sqrt{5} = (10\sqrt{5})/(\sqrt{5} \times \sqrt{5}) = 10\sqrt{5}/5 = 2\sqrt{5}$.
- Q16.** Let the odd numbers be $2n + 1$ and $2n + 3$. Sum = $4n + 4 = 4(n + 1)$, which is 4 times an integer — always divisible by 4.
- Q17.** $2 + 3 + 5 = 10$ parts. $\text{£}120 \div 10 = \text{£}12$ per part $\rightarrow \text{£}24, \text{£}36, \text{£}60$.
- Q18.** 15% of $\text{£}80 = \text{£}12$ (10% = $\text{£}8$, 5% = $\text{£}4$). $\text{£}80 + \text{£}12 = \text{£}92$. Answer: $\text{£}92$
- Q19.** Year 1: 3% of $\text{£}2000 = \text{£}60 \rightarrow \text{£}2060$. Year 2: 3% of $\text{£}2060 = \text{£}61.80 \rightarrow \text{£}2060 + \text{£}61.80 = \text{£}2121.80$. Answer: $\text{£}2121.80$
- Q20.** $y = kx^2$. $36 = k \times 36 \rightarrow k = 1$. When $x = 4$: $y = 1 \times 16 = 16$. Answer: 16
- Q21.** Pack A: $\text{£}1.20 \div 400 \text{ g} = \text{£}0.003/\text{g}$. Pack B: $\text{£}1.65 \div 600 \text{ g} = \text{£}0.00275/\text{g}$. Pack B is cheaper per gram. Answer: Pack B
- Q22.** $\cos(30^\circ) = \text{adjacent/hypotenuse} = 6/AC$. $AC = 6/\cos 30^\circ = 6 \div (\sqrt{3}/2) = 12/\sqrt{3} = (12\sqrt{3})/3 = 4\sqrt{3}$. Answer: $4\sqrt{3} \text{ cm}$

- Q23.** (a) The angle at the centre is twice the angle at the circumference: angle ACB = $110^\circ \div 2 = 55^\circ$. (b) PQ is a diameter, so angle PRQ = 90° (angle in a semicircle). Angle PQR = $180^\circ - 90^\circ - 35^\circ = 55^\circ$.
- Q24.** (a) $2a = (6, 2)$; $2a + b = (6+2, 2-4) = (8, -2)$. (b) $|a| = \sqrt{3^2 + 1^2} = \sqrt{10}$.
- Q25.** (a) Area = $(\sqrt{5} + 2)(\sqrt{5} - 2) = 5 - 2\sqrt{5} + 2\sqrt{5} - 4 = 1 \text{ cm}^2$. (b) Perimeter = $2(\sqrt{5} + 2) + 2(\sqrt{5} - 2) = 2\sqrt{5} + 4 + 2\sqrt{5} - 4 = 4\sqrt{5} \text{ cm}$.
- Q26.** P(red then red) = $\frac{3}{8} \times \frac{2}{7} = \frac{6}{56}$. P(blue then blue) = $\frac{5}{8} \times \frac{4}{7} = \frac{20}{56}$. P(same colour) = $\frac{6}{56} + \frac{20}{56} = \frac{26}{56} = \frac{13}{28}$. Answer: $\frac{13}{28}$
- Q27.** (a) $4 + 7 + 5 + 3 + 1 = 20$ footballers. (b) Total goals = $0 \times 4 + 1 \times 7 + 2 \times 5 + 3 \times 3 + 4 \times 1 = 0 + 7 + 10 + 9 + 4 = 30$. Mean = $30 \div 20 = 1.5$.