GCSE Examiners' Report

Mathematics
GCSE
November 2025

Introduction

Our Principal examiners' report provides valuable feedback on the recent assessment series. It has been written by our Principal Examiners after the completion of marking and details how candidates have performed in each unit.

This report opens with a summary of candidates' performance, including the assessment objectives/skills/topics/themes being tested, and highlights the characteristics of successful performance and where performance could be improved. It then looks in detail at each unit, pinpointing aspects that proved challenging to some candidates and suggesting some reasons as to why that might be.[1]

The information found in this report provides valuable insight for practitioners to support their teaching and learning activity. We would also encourage practitioners to share this document – in its entirety or in part – with their learners to help with exam preparation, to understand how to avoid pitfalls and to add to their revision toolbox.

Further support

Document	Description	Link
Professional Learning / CPD	WJEC offers an extensive programme of online and face-to-face Professional Learning events. Access interactive feedback, review example candidate responses, gain practical ideas for the classroom and put questions to our dedicated team by registering for one of our events here.	https://www.wjec.co.uk/home/professional-learning/
Past papers	Access the bank of past papers for this qualification, including the most recent assessments. Please note that we do not make past papers available on the public website until 12 months after the examination.	Portal by WJEC or on the WJEC subject page
Grade boundary information	Grade boundaries are the minimum number of marks needed to achieve each grade. For unitised specifications grade boundaries are expressed on a Uniform Mark Scale (UMS). UMS grade boundaries remain the same every year as the range of UMS mark percentages allocated to a particular grade does not change. UMS grade boundaries are published at overall subject and unit level. For linear specifications, a single grade is awarded for the subject, rather than for each unit that contributes towards the overall grade. Grade boundaries are published on results day.	For unitised specifications click here: Results, Grade Boundaries and PRS (wjec.co.uk)

[1] ***Please note that where overall performance on a question/question part was considered good, with no particular areas to highlight, these questions have not been included in the report.***

Exam Results Analysis	WJEC provides information to examination centres via the WJEC Portal. This is restricted to centre staff only. Access is granted to centre staff by the Examinations Officer at the centre.	Portal by WJEC
Classroom Resources	Access our extensive range of FREE classroom resources, including blended learning materials, exam walk-throughs and knowledge organisers to support teaching and learning.	https://resources.wjec.co.uk/
Bank of Professional Learning materials	Access our bank of Professional Learning materials from previous events from our secure website and additional pre-recorded materials available in the public domain.	Portal by WJEC or on the WJEC subject page.

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Executive Summary

Overall, candidates' performance on the November 2025 examination series was varied compared to November 2024, with higher mean scores on some papers, and lower on others. The papers however again provided an appropriate and fair test across all tiers. The assessments were broadly comparable in demand to previous series, and candidates at each tier were generally well prepared for many of the standard topics. As is typical for a November entry, there remained noticeable variation in the consistency of performance within each tier, with stronger candidates demonstrating clear working and good use of method, while others lost marks through avoidable arithmetic slips or attempts that were not fully supported by working.

Across Unit 1, candidates at all tiers often made a sound start to the papers. Familiar number skills, basic algebraic manipulation and straightforward applications of shape and space were usually well attempted. Many candidates showed confidence in areas such as expressing numbers in index form, identifying properties of number sets, substituting into simple formulae and interpreting basic statistical information. Graphing skills at the appropriate level were also secure for many candidates, particularly when tables of values were scaffolded.

However, a number of recurring weaknesses were evident. At Foundation tier, difficulties arose with the accurate use of a protractor, recognising properties of 2D shapes, understanding key circle terminology and drawing simple graphs. Many candidates also struggled with the common properties of numbers and the correct use of probability scales. At Intermediate tier, arithmetic accuracy remained a limiting factor for many, particularly when non-calculator methods were required. Questions involving the circumference of a circle, drawing on isometric paper, relative frequency and changing the subject of a formula continued to challenge a large proportion of candidates. Higher tier candidates showed understanding across many of the standard algebraic and graphical skills, but performance was more mixed on topics involving circle theorems, trigonometric graphs, rearranging more complex formulae and algebra involving fractions.

Unit 2 again reflected the differing demands within each tier. Foundation tier candidates were often successful with early procedural questions but encountered difficulty with nets, equations with unknowns on both sides and describing transformations. Intermediate tier candidates performed well in questions involving angle properties, puzzles using number facts, repeated percentage change and straightforward linear equations. More challenging areas included rounding within context, conversions between hours and minutes, algebra involving negative values and interior and exterior angles of regular polygons. At Higher tier, performance was strongest on standard topics such as Pythagoras' Theorem, trigonometric calculations in right-angled triangles, probability tree diagrams and algebraic simultaneous equations. The most demanding questions tended to be AO3 items requiring multi-step reasoning, including unstructured applications of the cosine rule, sector area problems and combining probabilities involving dependent and independent events.

As in every series, clear working, correct mathematical form and the accurate use of a calculator were distinguishing features of stronger scripts. Centres are encouraged to continue placing emphasis on the secure recall of key facts and formulae, consistent practice with multi-step reasoning and the development of confident algebraic and geometric skills across all tiers.

Our digital resources website offers blended learning lessons and knowledge organisers, among other materials. Please ensure you are accessing the correct site with legacy resources (link here) and not the sister site for the new Made-for-Wales qualification.

MATHEMATICS

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UNIT 1 FOUNDATION TIER

Overview of the Unit

Overall, the questions were comparable with those asked on previous papers that have been sat, and the paper was a suitable and fair test for the candidates at the Foundation level. Some questions proved more challenging than others, particularly the common questions.

Key areas for improvement include the following:

- Writing the largest possible 4-digit odd number (Q1e)
- Measuring angles (Q2b)
- Understanding and applying key terms related to circles (Q3)
- Solving problems involving circumference and perimeter (Q19)
- Knowing properties of 2D shapes (Q3b)
- Using the common properties of numbers (Q6, 13, 14)
- Calculating probability and using a probability scale (Q10, 14)
- Drawing straight line graphs (Q.16)
- Substitution and solving two-step linear equations (Q12)

The following topic areas were generally well-understood or well-answered:

- Rounding to the nearest thousand (Q1a)
- Adding two three-digit numbers (Q1b)
- Calculating 50% of a number (Q1c)
- Shading squares to make lines of symmetry (Q4)
- Calculating the mode of data sets (Q5a)
- Solving one-step linear equations (Q9b)

Comments on individual questions/sections

When a question or part-question is not listed, there are no areas to highlight.

Question 1
In question **1(c)**, many candidates struggled with borrowing (regrouping).
In question **1(d)**, a number of candidates attempted to find Omar's number by dividing 16 by 5, rather than multiplying.
In question **1(e)**, many candidates either did not understand the meaning of 'odd' or simply wrote the largest possible 4-digit number.

Question 2
Many candidates found difficulty using a protractor, frequently reading the scale incorrectly and giving an answer of 132˚.

Question 3
In question **3(a)(i)**, many candidates were unable to draw a tangent to the circle, with several drawing diameters instead.
In question **3(b)**, some candidates were unable to correctly draw a pentagon and instead drew a hexagon or an octagon.

Question 5(b)
Some candidates attempted to calculate the mean rather than the range, indicating a lack of understanding of the terminology within this topic.

Question 6 and 13
In question **6**, most candidates correctly identified the multiple of 5. However, many struggled to correctly identify both the square number and the factor of 60.
In question **13**, some candidates were able to give an example of a square number but did not provide examples of both an even and an odd square number.

Question 7
Many candidates struggled to calculate the width given the area. Some attempted to multiply 36 by 9, while others confused area with perimeter and incorrectly worked with a perimeter of 36cm.

Question 8 (OCW)
Many candidates multiplied the capacities of Tank A and Tank B by ½ rather than dividing, leading to the common incorrect answer of 5.5 jugs. In addition, many candidates did not clearly show or label their working.

Question 10
Many candidates were unable to correctly identify the lines of symmetry and the order of rotational symmetry for the given letters. While the letter H was often placed correctly, candidates frequently struggled with the placement of the other letters.

Question 11
Candidates often failed to calculate the probability of both events before placing them on the probability scale. As a result, many used the bar heights of 3 and 2 for B and S respectively, leading to the common incorrect placement of S at 0.2 and B at 0.3.

Commented [IH1]: Note for translation:
B and S stand for Black and Silver. On the Welsh paper, these are D and A for Du and Arian

Question 12
In question **12(b)**, some candidates gained the first method mark for forming 3C = 12, but many struggled to correctly calculate 22 × 0.5.
In question **12(c)**, many candidates attempted to obtain an embedded answer, which proved difficult as the value of p was not a whole number.

Question 15
Some candidates were able to list three values that satisfied at least one condition, most commonly identifying that Beti had four more counters than Anwen.

Question 18
Some candidates attempted to divide 40 by 16, but struggled to carry out this calculation.

Question 19
Many candidates did not use the circumference formula and failed to include π in their working. As a result, few candidates were able to gain the follow through marks available for calculating the value of x.

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UNIT 1 INTERMEDIATE TIER

Overview of the Unit

Overall, the questions were comparable with those asked on previous papers that have been sat, and the paper was a suitable and fair test for the candidates at the Intermediate level. As expected, some questions proved more challenging than others, especially in the second half of the paper.

Key areas for improvement include the following:

- Using non-calculator methods of adding, subtracting, multiplying, and dividing whole numbers and decimals (Q1c, 10, 15, 17ab)
- Applying the facts, formulae and definitions and properties that need to be learned (Q8, 9, 10, 14, 15b,18ab)
- Drawing cuboids on isometric paper (Q5)
- Completing a Venn diagram (Q13a)
- Solving problems involving relative frequency (Q14)
- Changing the subject of a formula involving brackets (Q16b)
- Using angle properties of circles (Q18)
- Solving fractional equations (Q19)

The following topic areas were generally well-understood or well-answered:

- Continuing a sequence of numbers, collecting like terms and solving simple linear equations (Q1)
- Identifying square, even and odd numbers (Q2)
- Solving numerical problems using given criteria (Q4)
- Substituting values into a formula (Q1c & 6a) and drawing a graph of a straight-line (Q6b)
- Finding the probability of an event occurring and the expected number of times an event occurs (Q3)
- Interpreting a Venn diagram (Q13b)
- Expressing a number as the product of its prime factors in index form (Q15a)

Comments on individual questions/sections

When a question or part-question is not listed, there are no areas to highlight.

Questions 1(c), 8, 17,
Many candidates understood the steps required to answer each question, but arithmetic errors were frequently seen.
In question **1(c)**, many candidates were unable to correctly calculate 22 × 0·5.
In question **8**, although many candidates used a correct method, some had difficulties calculating 40 ÷ 16.
In questions **17(a)** and **17(b)**, those who first converted the values into numbers usually calculated 360 ÷ 20 000 or even 3850 – 170 incorrectly.

Question 5
Although many candidates gave the dimensions of a cuboid with a volume of 16 cm³, many were unaware of how to correctly use the isometric paper to draw the cuboid. The three directions had to be vertical and along two 'diagonals' (forming a Y shape). All lines had to pass through the dots and have both ends on a dot.

Question 8 (OCW)
Some candidates gave their answer as 2.5 hours = 2 hours 50 minutes. Many candidates did not clearly label the stages of their working or the final answer. Common mathematical form errors included incorrect notation for time (e.g. 2:30).

Question 9
Questions involving the circumference of a circle continue to be challenging. Many candidates confused the formulae for area and circumference.

Question 10
Many candidates thought that 2 kilometres = 200 metres, while some even tried to convert kilometres into miles.

Question 11
Reflecting and rotating a non-standard shape proved very challenging for some candidates. In part **(a)** many did not know where the line $x = -1$ was located. In part **(b)**, many located the shape correctly but drew it incorrectly.

Question 12
Those who had a clear conceptual understanding of the mean and used calculations such as 6 × 4 = 24 were generally more successful than those who relied on trial-and-error methods. Some candidates missed the instruction that the four numbers needed to be different.

Question 13
Many candidates did not interpret the information in the question correctly and placed 5 and 20 directly in the Venn diagram. However, many candidates gained marks in parts **(b)** and **(c)** by using their Venn diagram correctly.

Question 14
Many candidates find the concept of relative frequency challenging, but they could gain marks by correctly finding the number of left-handed Year 12 pupils in their working.

Question 15
Some candidates could list the prime factors of 154, which gained 1 mark, but then could not use this to find the **highest** common factor of 2100 and 154. An answer of 7 was often seen.

Question 16, 18, 19
These questions, although some were fairly standard, proved very challenging for a number of pupils.
In question **16(b)**, many could expand the brackets but did not progress further.
In question **16(c)**, many candidates over-complicated their methods. Many failed to appreciate that, on inspection a × –9 = +18 for example.
In question **18**, some candidates successfully worked with the isosceles triangle, but few knew how to relate angles *DOB*, *DAB* and *DCB* to solve the problem fully.
Question **19** was poorly answered with a correct method for clearing the fractions very rarely seen. Some candidates worked with the left-hand side correctly but left the right-hand side as 5.

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UNIT 1 HIGHER TIER

Overview of the Unit

As expected, the performances on individual questions reflected the increasing level of demand in moving through the paper. Similarly, towards the end of the paper, the more challenging questions occasionally lacked an attempt.

Key areas for improvement include the following:
- Understanding the factorisation of a quadratic expression (Q6c)
- Manipulating fractions e.g. understanding that ÷2/3 is equivalent to ×3/2 (Q11)
- Understanding and using the alternate segment theorem, as well as being able to quote any of the circle theorems which are in the specification (Q14)
- Understanding the properties of trigonometric graphs (Q16)
- Changing the subject of a formula involving a square root (Q17)
- Recognising when it is necessary to consider different orderings of events in order to calculate a probability (Q18)

The following topic areas were generally well-understood or well-answered:
- Rotating a given shape in the xy-plane (Q1)
- Understanding mean, median and range (Q2)
- Expressing a number as a product of its prime factors (Q5a)
- Extracting common factors; re-arranging a simple formula (Q6)
- Understanding standard form (Q7)
- Understanding a fractional index (Q10)

Comments on individual questions/sections

When a question or part-question is not listed, there are no areas to highlight.

Question 3(a)
Some candidates did not realise that each of the given frequencies of 5 and 20 included the intersection in the Venn diagram.

Question 4(b)
A significant proportion of candidates successfully found the number of left-handed students in Year 12. Fewer were then able to combine the appropriate frequencies in order to correctly obtain the overall relative frequency.
In terms of the OCW aspect, plenty of candidates offered well-structured solutions and used correct notation. However, there was some common confusion in terminology, particularly in failing to distinguish between 'relative frequency' and 'frequency'. Some candidates were penalised for their inappropriate mathematical form e.g. using a decimal numerator within a fraction, mis-using the 'equals' sign, or writing 21/200+30/150 where it should have been (21+30)/(200+150).

Question 5(b)
An incorrect answer of 7 was frequently seen (as the 'highest common *prime* factor' of 2100 and 154, as opposed to the required 'highest common factor').

Question 6(c)
Most candidates found this to be a very challenging part-question, often undertaking lengthy, unnecessary and inaccurate algebraic procedures.

Questions 7(a) and 7(b)
Plenty of candidates gained full marks here. However, some presented their answers in standard form, without observing the instructions to express the respective values as 'a decimal number' and 'in figures'.

Questions 8(a) and 8(b)
Most were able to calculate angle *BOD* at the centre, but some could not then apply the appropriate circle theorem (e.g. doubling when they should be halving, or subtracting the angle at the centre from 180°).

Question 9
Whilst many candidates successfully used a common denominator of 12 on the left-hand side, some could not correspondingly handle the 5 on the right.

Question 11
This proved to be a challenging question. The first mark was for expressing calculations for the volumes of both the cone and the cylinder, but both of these were prone to errors (even with the cone formula being available in print at the beginning of the paper). Those who did gain the first mark were often unable to proceed further, usually due to an inability to cope with the fractions, or due to not realising that π could be eliminated.

Question 12
Some candidates lost the final mark in part **(a)**, either for failing to present a formula, or for using inadequate notation in their attempt to do so.

Question 14
This was the second question on circle theorems on this paper, and it was clearly more challenging than Q8. Many were able to identify the angles in the same segment, but only a few were able to correctly apply the alternate segment theorem. Written reasons were required, and this caused further difficulty, with inaccurate terminology often seen.

Question 15
There were plenty of candidates who successfully manipulated the surds, but a significant number then presented their final ratio as $8\sqrt{5}$**:**$10\sqrt{5}$, without undertaking either of the necessary steps of simplification.

Questions 16(b)(i) and 16(b)(ii)
It was apparent that only a small minority of candidates knew the properties of the graph of $y = \cos x$, with even fewer able to undertake the necessary vertical translation.

Question 17
There was a clear contrast between candidates' performance in this question on re-arranging a formula and that of Q6**(b)**, reflecting the increased demand at this later stage of the paper. The first step should have involved squaring 5, but this was rarely done correctly.

Question 18
This proved to be a demanding question on probability. Of those who made progress, many failed to consider all possibilities, often not accounting for the different permutations of events.

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UNIT 2 FOUNDATION TIER

Overview of the Unit

In general, candidates were more successful with the earlier questions in the paper, but they were able to access some of the questions common with the Intermediate tier e.g. calculator use (Q14) and solving basic equations (Q15a).

Key areas for improvement include the following:
- Drawing nets (Q6)
- Calculating the area and perimeter of a square (Q8)
- Solving equations with unknowns on both sides (Q15c)
- Using angle properties of regular polygons (Q16)
- Describing transformations (Q19)

The following topic areas were generally well-understood or well-answered:
- Working with calculation boxes (Q1)
- Describing chance (Q2)
- Using the correct order of operations (Q5a)
- Listing outcomes (Q7)

Comments on individual questions/sections

When a question or part-question is not listed, there are no areas to highlight.

Question 2
Candidates were often successful at describing events which were unlikely, impossible or certain. However, they found it much more challenging to describe an event with a dice which had an even chance, with 'getting a 3' the common incorrect answer.

Question 6
Instead of drawing a net, most candidates simply tried to draw a 3D drawing of the cuboid. Those who demonstrated some awareness of nets, often drew three more identical faces with length and width the same as the base which had already been drawn for candidates.

Question 7
This was well answered by candidates. The common incorrect answer was to simply write B 2 and C 3 to accompany the A 1 which had already been exemplified to candidates.

Question 8
This was the OCW question and was poorly answered by candidates.
Very few candidates were able to find the correct area of the square (144 cm^2) which they could use to find the side length of 12 cm. Most candidates simply used one or both of the values given in the question (125 and 160) as the side length of the square. Hence, the common incorrect answer for the perimeter was 570 cm.Disappointingly for the OCW question, candidates often didn't show any working, use labels or include units in their answers.

Question 15c
Very few correct answers were seen in this question. Few candidates were able to carry out a correct first step, with many incorrectly getting $3p$ from $5p - 2$ and -$15p$ from $2p - 17$.

Question 16
Correct answers of 20° were occasionally seen in **(a)**, but it was very rare to see correct answers in **(b)** and **(c)**. Very few candidates demonstrated any awareness of the angle properties of regular polygons, with $^2/_5$ of candidates not even attempting to answer either part.

Question 19
It was very rare to see a fully correct response to this question. Some candidates picked up one mark for identifying the transformation as an enlargement or stating that the shape was 3-times bigger, but reference to the centre of enlargement was rarely seen.

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UNIT 2 INTERMEDIATE TIER

Overview of the Unit

Overall, the paper was a suitable and fair test for candidates at the Intermediate tier. The questions were comparable to those asked in previous series. As expected, some questions proved more challenging than others, and some candidates lost marks due to incorrect numerical evaluations or unsupported answers. Candidates should be encouraged to use a calculator where appropriate, but must remember to show their working when required.

Key areas for improvement include the following:
- Rounding as part of a question (Q2a, 6, 16a)
- Converting hours given as a decimal into hours and minutes (Q2b)
- Using negative values within algebra (Q7d, 10, 20)
- Working with interior and exterior angles of regular polygons (Q9)
- Fully describing a transformation (Q12)
- Constructing 60° and 45° angles (Q14)

The following topic areas were generally well-understood or well-answered:
- Using angle properties of triangles, straight lines and angles around a point (Q4)
- Using facts such as halves, square roots and multiples to solve a number puzzle (Q5)
- Solving simple linear equations involving decimals (Q7)
- Finding a repeated percentage decrease of a quantity (Q8)
- Finding an unknown side of a cuboid given the volume (Q16a)

Comments on individual questions/sections

Questions 2(a), 6 and 16(a)
Although many candidates evaluated the calculations correctly, a significant number did not round as specified in the question, or did not round at all. In Question 6, some candidates also did not treat the fraction correctly when using a calculator, or incorrectly included the 7.9^2 as part of the square root.

Question 2(b)
Most candidates carried out the calculation correctly but gave a final answer of 16 hours 25 minutes.

Question 3
Candidates often found it difficult to decide which units to convert in order to make the measures comparable. Many numerical errors were seen, limiting candidates to a maximum of two marks, with many gaining only one mark for a single correct conversion. Some candidates did not gain any marks.

Questions 7(d), 10 and 20
Although some parts of these questions were fairly standard, they proved challenging due to the involvement of negative numbers. In Question **7(d)**, arithmetic errors were frequently seen, such as incorrectly adding 2 to −17 or changing −17 to a positive value. In question 10, errors occurred when expanding brackets, with some candidates also attempting to solve an equation by equating the x-term to the constant. In Question 20, many candidates

successfully used a method to eliminate one variable by equating the coefficients of x or y. However, errors often occurred when subtracting a negative value to obtain the first variable.

Question 8
Many candidates were able to gain full marks using a calculator. Some candidates calculated intermediate percentages to reach 54%, but this approach often led to numerical errors, particularly when methods were incomplete. Calculating 54% of 1350 using this approach resulted in additional errors.

Questions 9(a), (b) and (c)
Overall, these parts were poorly answered, with only a minority of candidates gaining marks. Responses showed limited understanding of the interior and exterior angles of regular polygons, and many candidates were unable to justify why the statements given were incorrect. In part **(c)**, many candidates calculated 360° ÷ 6 = 60° or 60° × 6 = 360°, but failed to explain that a regular hexagon has total interior angles of 720°, or that 60° represents the exterior angle rather than the interior angle.

Question 11
The majority of candidates gained three marks for correct answers. A common misconception was to calculate Huw's share by dividing by 5 instead of 6, despite Rhian's share being stated as five times Huw's share.

Question 12
Describing the transformations of the triangles proved challenging, with many responses gaining no marks due to incorrect translations. Most single marks were awarded for identifying the scale factor as 3 (often expressed as "three times bigger" or "multiply by 3"). Few candidates used the term *enlargement*, and references to the centre of enlargement, such as (0,0) or the origin, were rare.

Questions 14(a) and (b)
The vast majority of candidates were unable to use a pair of compasses to correctly construct angles of 60° and 45°. In many cases, it was evident that a ruler and protractor had been used, with arcs added retrospectively. Candidates must show their initial construction arcs to indicate the placement of the compasses before drawing intersecting arcs.

Question 17
Many candidates were able to identify the diameter as 6. However, errors were frequently made when finding the dimensions of the triangle and when applying the formula to calculate the area of the triangle.

Question 19(a)
Completing the branches on a tree diagram is usually well understood. However, this question proved difficult because the combined probability of two events was given. Many candidates incorrectly used 0.06 as the probability of selecting a red counter from Bag B, rather than calculating 0.06 ÷ 0.3 = 0.2. In addition, many candidates wrote the combined probability on the answer lines intended for labelling.

Question 21
Many candidates did not engage with bounds and therefore did not gain any marks. Those who did use the correct upper bound of 40.5 cm were often able to make progress, although many obtained 28.5 cm without demonstrating a full method. Some candidates then recognised that, as this was the upper bound, the value of x should be 28 cm and were able to gain full marks.

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UNIT 2 HIGHER

Overview of the Unit

Overall, the paper was a suitable and fair test for the candidates at the higher level and was comprised of mainly standard topics assessed in these units. However, AO3 style questions were asked throughout the unit and it was these questions that generally caused the most difficulty for candidates, whether it was asked in the first or second half of the paper. Candidates performed strongly in the first half of the paper which are the questions common to the intermediate tier.

Key areas for improvement include the following:

- Factorising more complex expressions involving an embedded quadratic formed from the difference of two squares (Q11a)
- Factorising quadratic expressions involving a bracket, which is the common term (Q11c)
- Using the laws of indices with fractional and negative powers (Q15)
- Constructing a 45° angle at a point using a ruler and a pair of compasses (Q2b)
- Answering AO3 unstructured questions involving the cosine rule and area of a sector (Q18b)

The following topic areas were generally well-understood or well-answered:

- Using and applying Pythagoras' theorem (Q1)
- Using trial and improvement to solve equations (Q3)
- Working with mass, density and volume (Q4)
- Working with trigonometry in right-angled triangles (Q6)
- Using probability tree diagrams (Q7)
- Solving simultaneous equations algebraically (Q8)
- Using the cosine rule directly from the formula page to calculate the length of a missing side (Q18a)

Comments on individual questions/sections

When a question or part-question is not listed, there are no areas to highlight.

Question 2(b)
Some candidates did not know how to construct a perpendicular at point B.
However, if there was a perpendicular drawn, constructed correctly or incorrectly, many candidates did know how to bisect it correctly using construction arcs.

Question 5
This was an AO3 problem-solving question.
Many candidates knew that the problem involved calculating the diameter (or radius) of the circles. However, some candidates failed to realise that the triangle's height and width were simple multiples of the diameter/radius of the circle and that $\frac{\text{base}\times\text{height}}{2}$ could be used to work out its area.

Question 6
Some candidates over-complicated the problem by using a combination of right-angled trigonometry, the sine and cosine rules and Pythagoras' theorem. If this multi-step approach was adopted, some candidates lost accuracy marks due to premature approximation.

Question 8
Incorrectly dealing with the negative y term in the second equation was a common error seen.

Question 9
The majority of candidates knew that the upper bound of the length of the rectangle was 40·5cm and used it correctly to work out the missing side x, but some candidates failed to realise that the resulting value of x was its upper bound, and therefore they forgot to round down to 28cm. 28·5cm was a common final answer if full marks were not gained.

Question 11(a)
Many candidates factorised out a correctly but then failed to spot that the resultant quadratic was formed from the difference of two squares.

Question 11(c)
The vast majority of candidates who attempted the question expanded and simplified the expression first. However, they did not proceed to factorise it after that.

Question 13
Many candidates knew to calculate the second difference of the sequence (in this case 6) or knew it involved n^2. However, the first mark could only be awarded for sight of $3n^2$.

Question 14
Most candidates knew they had to use πrl from the formula page. However, they did not use the slant height derived from using Pythagoras' theorem with the height of the cone and the radius of the base. The height of the cone (30cm) was often used as the slant height.

Question 17
Some candidates failed to deal with the x in the denominator correctly. Some candidates did not deal correctly with a negative number for the b terms in the quadratic formula, mainly the b^2 term of the discriminant.

Question 18(b)
Many candidates knew they had to calculate angle *BEC* for the area of the sector by subtracting angle *AEB* from 180°. However, correctly calculating angle *AEB* was the main problem. Incorrectly rearranging the cosine rule was a common error, and there was also confusion as to which sides to use for their a, b and c to work out angle *AEB*.

Question 19
Many candidates could work out the probabilities for either the three independent events or the three dependent events. Some candidates subsequently added these probabilities together. However, some candidates forgot to multiply by ½ as the question also involved flipping a coin. Also, some candidates mistakenly included further permutations into their answer, often incorrectly multiplying by 3.

Supporting you

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