Qualification Accredited

OCR
Oxford Cambridge and RSA

GCSE (9–1)

Examiners' report

MATHEMATICS

J560

For first teaching in 2015

J560/02 November 2024 series

Version 1

ocr.org.uk/maths

Contents

Introduction

Our examiners' reports are produced to offer constructive feedback on candidates' performance in the examinations. They provide useful guidance for future candidates.

The reports will include a general commentary on candidates' performance, identify technical aspects examined in the questions, highlight good performance and where performance could be improved. A selection of candidate responses are also provided. The reports will also explain aspects that caused difficulty and why the difficulties arose, whether through a lack of knowledge, poor examination technique, or any other identifiable and explainable reason.

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.

A full copy of the question paper and the mark scheme can be downloaded from OCR.

Paper 2 series overview

This non-calculator paper is the second of three papers taken by Foundation tier GCSE (9-1) Mathematics candidates.

Generally, candidates engaged well with the exam paper and attempted most of the questions. There were however large numbers of candidates who did not attempt the more challenging questions towards the back of the paper (this was especially true of the final three questions).

The paper was generally accessible to candidates, especially Questions 1-4 (which assessed candidates' understanding of multiples, factors, basic arithmetic, analysis of statistical diagrams and area of a rectangle). Candidates of all abilities were able to successfully engage with these questions and most scored highly.

One area of development for candidates is knowledge of metric conversions and time calculations, as assessed in Question 5. Through the middle part of the paper, candidates engaged well with the questions. It was pleasing that in longer questions in the middle of the paper, candidates were able to show a large variety of techniques and generally communicated this clearly to the examiners. Many structured their work well, however, a small number of candidates would benefit from responding in a more systematic way (work with multiple attempts and a lack of structure cost some candidates marks).

The final three questions demonstrated topics that candidates would benefit from improving. On Question 21 only a small fraction of candidates demonstrated understanding of how a quadratic equation links to its graph. On Question 22 candidates struggled to correctly equate the two sides of an isosceles triangle, which involved solving an equation with unknowns on both sides and then applying this in context. Question 23 was a challenging question and candidates were generally not able to use Pythagoras' theorem and trigonometry correctly.

A further area for development is in responding to questions that asked for candidates to explain their understanding. Responses often lacked focus and didn't always make sense. Candidates are advised to take their time in answering such questions and focus on clearly answering the question.

Candidates who did well on this paper generally:	Candidates who did less well on this paper generally:
• were able to correctly interpret data from statistical diagrams • knew the correct metric conversions, including area scale factors • correctly found missing terms in sequences and could find the *n*th term • were able to complete fractional arithmetic • could use and interpret frequency trees • could correctly calculate values from powers (e.g. 2^5) and also demonstrated an understanding of negative powers • could demonstrate a range of techniques to answer more complex problems • demonstrated a sound understanding of square and cube numbers • could make links between the equation of a quadratic and the graphical intersection of the *x* and *y* axes • could correctly apply Pythagoras' theorem to a multi-step question.	• did not show secure knowledge of conversions between metric measurements • did not correctly convert between decimal hours or minutes to hours and minutes • were not able to find two numbers given their sum and difference • did not demonstrate an understanding of the inverse of a given transformation • did not show systematic working, including not giving a final answer • did not appreciate that when a question asks for an explanation as to why a solution is incorrect, the explanation must explain the error and not just offer the correct solution • worked backwards from the value given in 'Show that' questions, rather than using the information to work towards the given value.

Question 1 (a)

1 **(a)** Write down a multiple of 9 between 30 and 40.

(a) ..... **[1]**

Most candidates scored the mark here.

Incorrect answers were generally either multiples of 9 that were outside of the given range (e.g. 27 or 45) or numbers in the correct range that were not multiples of 9 (e.g. 33 or 39).

Question 1 (b)

(b) Write down a factor of 100 between 11 and 30.

(b) ..... **[1]**

Many candidates scored the mark here. A small number of candidates gave both of the valid answers (i.e. 20 and 25), which was given the mark, however others who gave extra values that were not correct were not given credit. A small number wrote their answer as a multiplication including an extra value, e.g. '5 × 20' and in this example 5 is not between 11 and 30, therefore credit could not be given.

Common incorrect answers were 15 or a factor of 100 that was outside of the given range (e.g. 10 or 50).

Question 2 (a)

2 Work out.

(a) $7 + {}^{-}5$

(a) ..... **[1]**

Many candidates answered this question correctly.

Common incorrect answers were $^{-}2$ and $^{-}12$.

Question 2 (b)

(b) 26×6

(b) ..... **[1]**

Most candidates answered this question correctly. Candidates used a wide variety of methods and the most successful were the traditional column multiplication or a grid. Those that didn't reach the correct answer often wrote long lists that contained arithmetic errors or showed no working at all.

Question 2 (c)

(c) $1648 \div 8$

(c) ..... **[1]**

Many candidates were successful at this question, however there was more success with the multiplication in Question 2 (b) rather than the division here. The most common error was to omit the 0 in 206 and give a final answer of 26. The most common method was the 'bus stop' method of short division; those who did not complete this correctly generally either omitted remainder numbers or made arithmetic errors.

Question 2 (d)

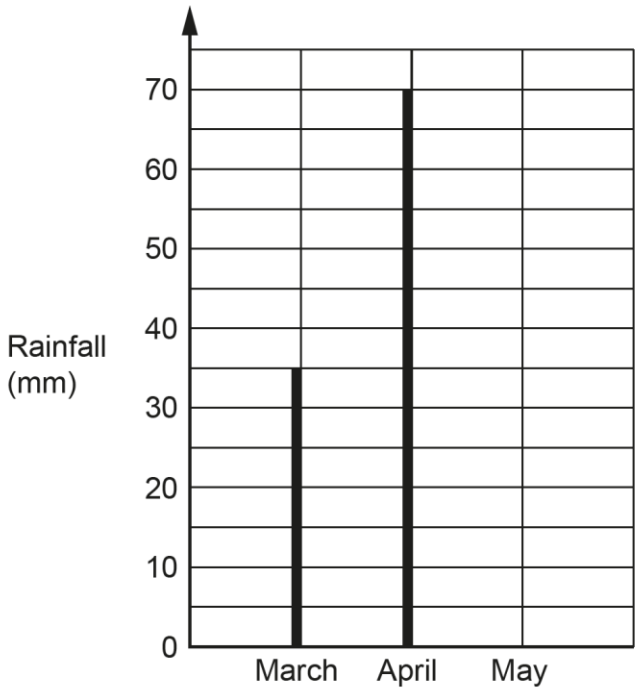
(d) $4.78 + 5.3$

(d) ..... **[1]**

Most candidates were able to correctly answer this question. The most common causes of error were not correctly lining up the decimal points in a column addition or omitting to carry the 1 from 7 + 3.

Question 3 (a)

3 The vertical line chart shows the rainfall, in millimetres (mm), in March and April.



(a) Write down the rainfall in March.

(a) ..... mm **[1]**

This question was correctly answered by a very high proportion of candidates. A few responded with 70, presumably from reading the value for April instead.

Question 3 (b)

(b) In May there was 55 mm of rainfall.

Complete the vertical line chart for May. **[1]**

This question was successfully answered by most. Common errors were vertical lines that were too high, only giving a point rather than a vertical line, or adding a horizontal line (usually across to 55).

Candidates should also consider that their bar ought to be similar in width to the ones given for March and April in the chart.

Question 3 (c)

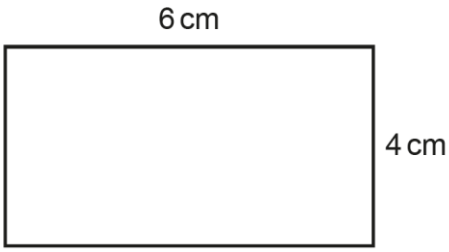
(c) Work out the **total** rainfall for March, April and May.

(c) ..... mm **[2]**

Most candidates gave the correct answer of 160. A follow through (FT) mark was given for candidates who had an incorrect value for Question 3 (a). Candidates who showed working by giving the three values they were using generally picked up at least 1 mark, however a small number of candidates showed no values and were given 0 marks.

Question 4

4 Here is a rectangle.



Not to scale

Work out the area of the rectangle.

..... cm^2 **[2]**

Many candidates scored full marks here.

A common misconception was to calculate 6 × 4 and then halve the answer, presumably confusing area of a rectangle with area of a triangle. Others added four lengths to calculate the perimeter of the rectangle.

Question 5 (a) (i)

5 **(a)** Complete each statement.

(i) 35 kilograms = ... grams. **[1]**

A small proportion of candidates correctly answered this question, but most candidates scored no marks throughout Question 5 (a). The most common incorrect answers here were 3500, 350 or 3.5.

Question 5 (a) (ii)

(ii) 203 millilitres = ... litres. **[1]**

A small proportion correctly answered this question. The most common incorrect answers were 20300, 203, 20.3, 23, 2.3 and 2.03.

Question 5 (a) (iii)

(iii) 4 square centimetres = ... square millimetres. **[1]**

Again, a small proportion of candidates correctly answered this question. The most common incorrect answers were 0.4, 4, 40 and 4000.

Key point: Metric conversions

Candidates did struggle at times where they were expected to convert metric units.

This included knowing the conversions of weight, capacity and area.

Very few candidates stated any conversions (e.g. '1000 grams = 1 kg') before attempting any part of Question 5 (a).

Question 5 (b)

(b) A train travels 90 km at an average speed of 40 km/h.

Work out the time taken for this journey.
Give your answer in hours and minutes.

(b) ..... hours ..... minutes **[3]**

Most candidates did not score any marks in this question.

The most common misconception was to calculate 90 × 40 rather than 90 ÷ 40. Others did not show an explicit method at all and just wrote numbers in the response.

Candidates who were able to correctly find 90 ÷ 40 = 2.25 were given 2 marks, however a significant number of these then incorrectly gave the final answer 2 hours 25 minutes.

A small number of candidates were given 1 mark, either the Special Case (SC) mark for 2 hours 25 minutes (where no other marks had been given) or the M1 mark for correctly converting their total minutes or decimal hours into hours and minutes.

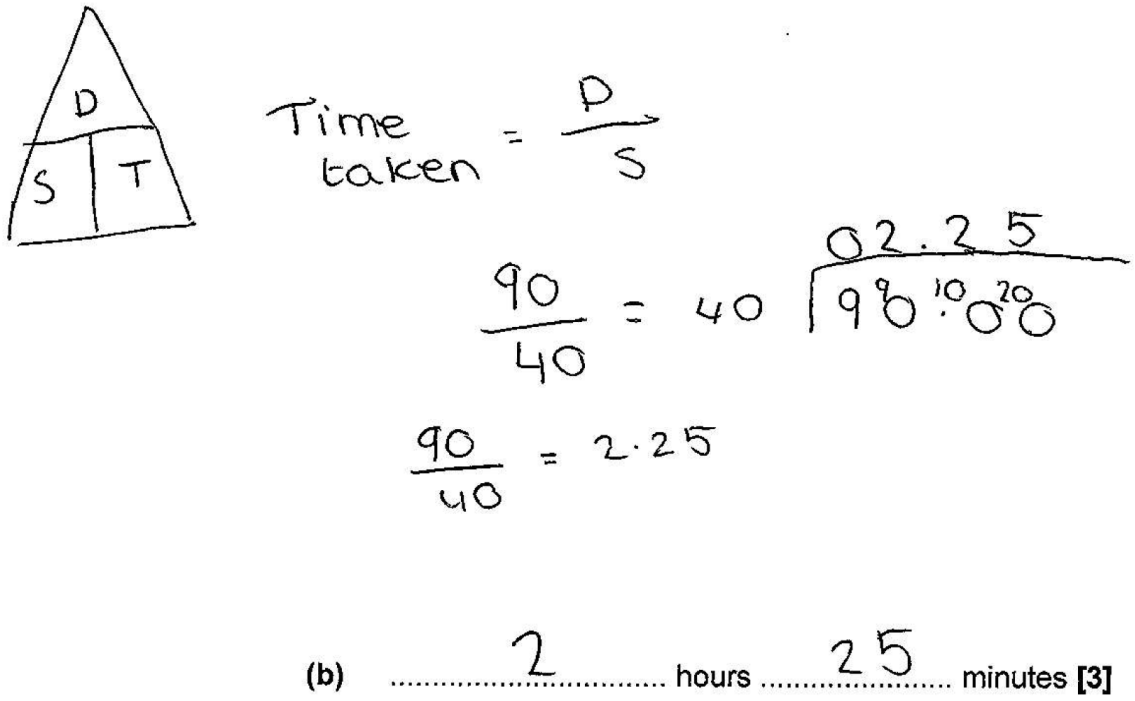
Key point: Time calculations and conversion to hours and minutes.

In questions like Question 5 (b), candidates should show their method clearly and set their work out accordingly. A very common misconception is that 2.25 hours = 2 hours 25 minutes.

Candidates who worked in fractions (e.g. $\frac{90}{40} = \frac{9}{4} = 2\frac{1}{4}$ hours) tended to be more successful as many recognised that $\frac{1}{4}$ hour is 15 minutes.

Candidates also made errors in time conversions in Question 19 (a), where 4 hours was often incorrectly converted into 400 mins.

Exemplar 1



The above shows a very common misconception.

The candidate correctly calculates $\frac{90}{40}$ to be 2.25 and this is given 2 marks.

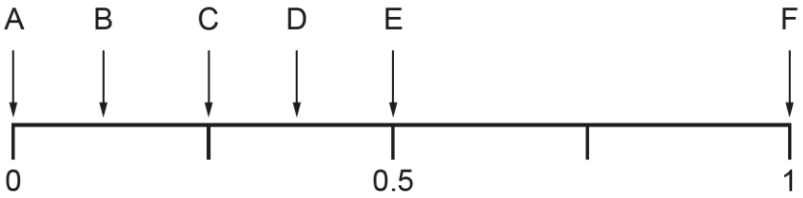
The candidate then however equates 2.25 hours to 2 hours and 25 mins, which is incorrect. The final answer should be 2 hours 15 minutes.

Question 6 (a) (i)

6 There are 16 coins in a bag.

- Six 5p coins.
- Two 10p coins.
- Eight 20p coins.

(a) The diagram shows a probability scale.



One coin is taken at random from the bag.

Which arrow shows the probability that the coin:

(i) has a value of less than £1,

(a)(i) ..... **[1]**

Roughly the same number of candidates were successful in this question as were unsuccessful. Along with the other parts of this question, a small number of candidates gave a numerical value instead of using the given letters on the probability scale (this was condoned if the value was correct). Incorrect responses generally either gave C, E or an incorrect numerical value.

Question 6 (a) (ii)

(ii) is a 20p coin,

(ii) ..... **[1]**

Few candidates correctly answered this question. Common errors were C, D or F.

Question 6 (a) (iii)

(iii) is a 50p coin?

(iii) ..... **[1]**

Most candidates gave the correct answer A.

Common errors were B, C, F, or giving an incorrect numerical value.

Question 6 (b)

(b) More coins are added to the 16 coins already in the bag.
One coin is taken at random from the bag.

The probability of the coin being a 5p, a 10p or a 20p coin are now all equal.

Find the **minimum** number of coins that must be in the bag.

(b) ..... **[2]**

Nearly half the candidates scored marks on this question, with most of these scoring full marks for the correct answer of 24.

Of those who scored 1 mark, it tended to be the Special Case (SC) mark for a multiple of 3 greater than 24.

Candidates who did not score generally gave a multiple of 3 that was lower than 24, or another incorrect value without working.

Out of Questions 1-10, this was the one most omitted.

Question 7 (a)

7 **(a)** Work out.

$\frac{1}{3}+\frac{2}{7}$

(a) ..... **[2]**

Many candidates successfully answered this question. Most found a correct common denominator (generally 21). A small number of candidates made arithmetic errors in finding the numerator of one or both fractions, or in adding together the numerators. Lower performing candidates just added the numerators and denominators to get $\frac{3}{10}$.

Question 7 (b)

(b) Work out.

$\frac{5}{8}\times\frac{7}{10}$

Give your answer in its simplest form.

(b) ..... **[2]**

Many candidates scored at least 1 mark on this question, with many scoring full marks.

Most showed the multiplication of the denominator and numerator to achieve $\frac{35}{80}$ (or equivalent) for M1. Some candidates however incorrectly simplified this, or did not simplify. Lower performing candidates found common denominators and then multiplied the numerators, or used methods associated with division of fractions.

Question 8 (a) (i)

8 (a) A sequence is generated using the rule:

- multiply the previous term by 3
- then subtract 1.

The **2nd** term of the sequence is 20.

(i) Find the **3rd** term of the sequence.

(a)(i) ..... **[1]**

Most candidates gave the correct answer of 59. Those who did not score had generally either made arithmetic errors or omitted the question entirely.

Question 8 (a) (ii)

(ii) Find the **1st** term of the sequence.

(ii) ..... **[2]**

Most candidates gave the correct answer of 7 and scored 2 marks.

A small number of candidates scored 1 mark for a correct method with arithmetic errors, or for giving an embedded answer of $7 \times 3 - 1 = 20$. The most common misconception was to find $\frac{20 - 1}{3}$, usually leading to 6.(666…).

Question 8 (b)

(b) Here are the first four terms of a different sequence.

5 10 15 20

Find the *n*th term of the sequence.

(b) ..... **[1]**

Even though the mark scheme condoned poor notation and equivalent answers here, quite a few candidates were unsuccessful.

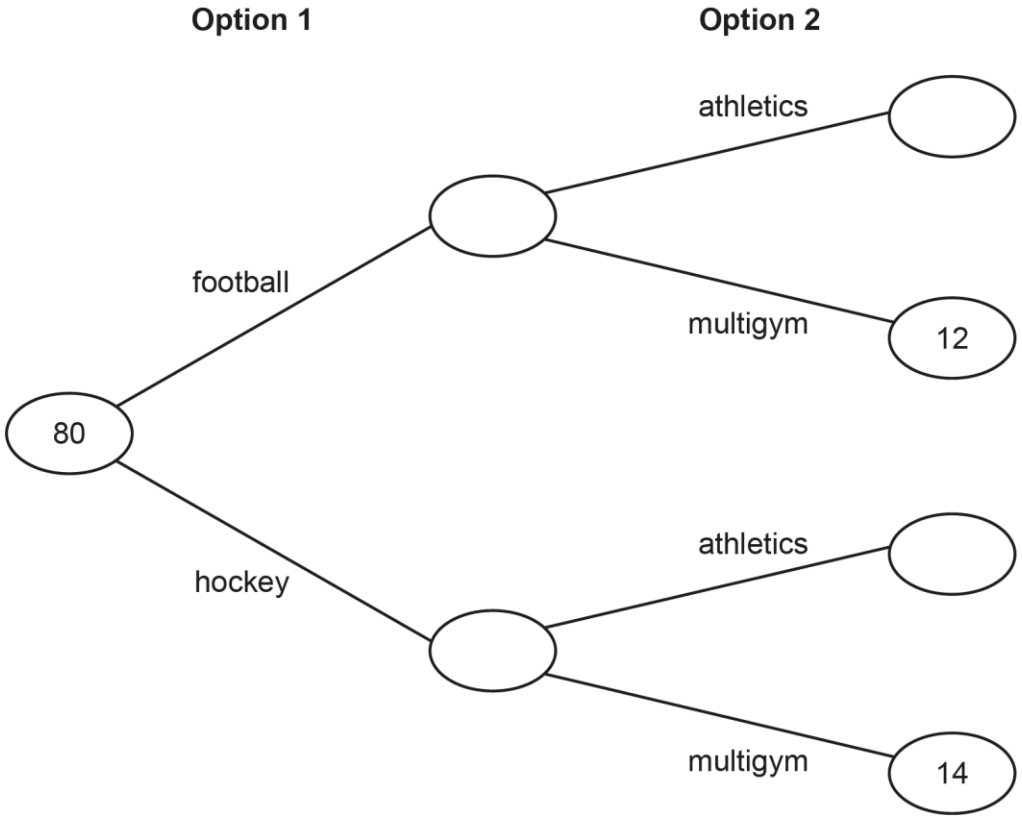
The most common errors were $n + 5$, $5n + 5$, $\times 5$ or calculating the next number in the sequence (usually giving 25).

Question 9 (a)

9 80 students each chose two activities, one from Option 1 and one from Option 2.

Option	Activity
1	football or hockey
2	athletics or multigym

This frequency tree shows the number of students choosing some of the activities.



(a) How many more students chose hockey and multigym rather than football and multigym?

(a) ..... **[1]**

Most candidates answered this question successfully. A small number gave incorrect answers of 12, 14 or 26.

Question 9 (b)

(b) Ten more students chose football rather than hockey.

Complete the frequency tree. **[4]**

Many candidates scored marks on this question, however only a small proportion scored full marks.

A common error was to have 50 students choosing football and 30 choosing hockey. This however often resulted in 38 and 16 choosing Athletics in Option 2, which resulted in 2 marks being awarded.

Candidates who were successful showed their working in the space provided below Question 9 (b), while those less successful tended to show no working.

Key point: Finding two numbers given their sum and difference.

A number of candidates struggled to find two numbers whose sum was 80 and that had a difference of 10. The most successful gave one of the following methods.

Method 1

Hockey = x and Football = $x + 10$

$x + x + 10 = 80$

$2x + 10 = 80$

$2x = 70$

$x = 35$

Candidates then found football as 45.

Method 2

The sum is 80 and the difference is 10.

$\frac{80}{2} = 40$

$\frac{10}{2} = 5$

$40 + 5 = 45$

$40 - 5 = 35$

Irrespective of the method used, those who were most successful checked that their numbers for football and hockey had a sum of 80 **and** a difference of 10.

Question 10 (a)

10 (a) The table shows charges made by a gas company to its customers.

Cost per day	27p
PLUS	
Cost per unit of gas used	8p

The owner of a flat receives a gas bill covering a period of 100 days.
They have used 7000 units of gas in this period.

Show that their bill is for £587. **[4]**

Many candidates answered this question correctly. As a 'Show that' question, it is important that candidates use the given information and arrive at an answer of £587. Lower performing candidates often started with £587 and tried to work back to the given information.

Candidates needed to show their calculations and have the correct units and conversions between pence and pounds. Lower performing candidates mixed up the units and/or made arithmetic errors, for example 0.8 × 7000 = 560 was common, as was answers of 560p and 27p being equated to £587.

Question 10 (b)

(b) The owner of a house is supplied gas by a different gas company.

- The cost per day is 25p.
- They use 10 000 units of gas in 100 days.
- Their bill covering the period of 100 days is £975.

Work out the cost per unit of gas used, giving your answer in pence.

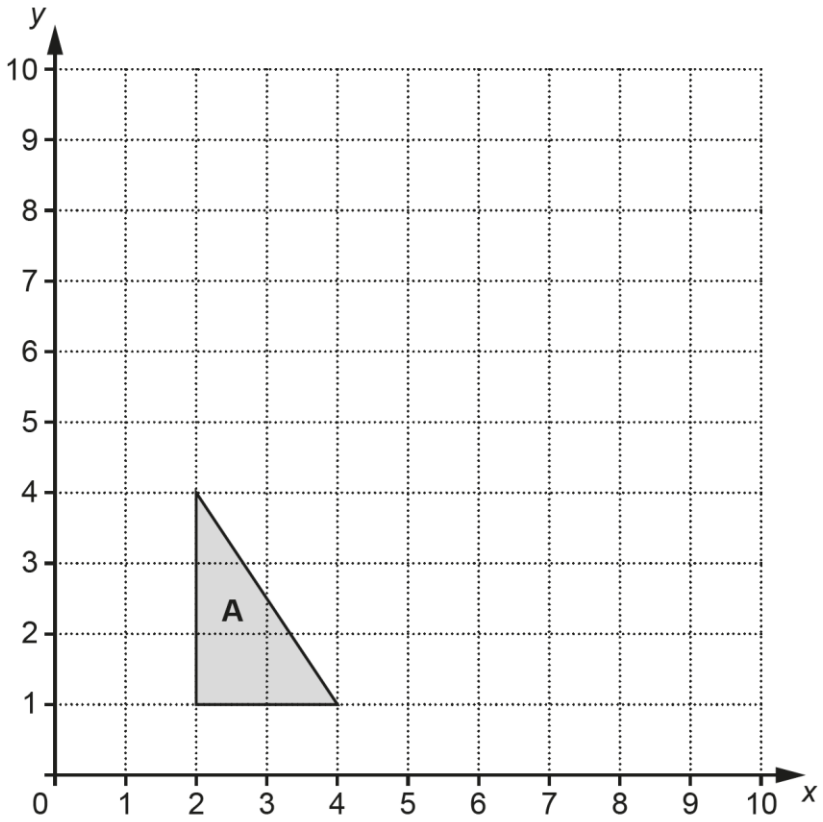
(b) ..... p **[4]**

Most candidates received either 0 or 1 mark on this question. Candidates were usually able to find the standing charge for 100 days (25p × 100 = £25) for the B1 mark. Some candidates were then able to go on to 975 – 25 = 950, but then struggled to divide this by either 100 or 10 000 (the Special Case mark of 2 (SC2) was common here).

A small number of candidates gave their final answer in pounds rather than pence.

Question 11 (a)

11 Triangle **A** is drawn on the grid below.



(a) Enlarge triangle **A** by scale factor 2 with centre of enlargement (0, 1).
Label the image **B**. **[3]**

Candidates were generally successful in picking up at least some marks here. Many were given 2 marks for a correct enlargement in the wrong place. A common error was using (0, 1) as one of the vertices rather than the centre of enlargement.

A small number of candidates were very untidy in their drawing. Others drew an enlargement that was outside of the given grid. Some not only enlarged the shape, but also rotated or reflected their final triangle.

Question 11 (b)

(b) Complete the description of the **single** transformation that maps triangle **B** back to triangle **A**.

Enlargement by scale factor ..... with centre of enlargement ..... **[2]**

Most candidates were not successful here. Of those who did score, this was generally 1 mark for giving the centre of enlargement as (0, 1). A large number of candidates gave their coordinate without brackets (this was condoned in the mark scheme, however it is important that candidates be aware that coordinates should always be in brackets).

It was rare to see the scale factor given correctly as $\frac{1}{2}$. Many gave $^-2$ or $\div 2$ instead.

Key point: Finding the inverse of a given transformation

When calculating the inverse of a given enlargement, most candidates seemed unaware that the centre of enlargement would remain the same and fewer still that the scale factor would be the reciprocal of the given scale factor.

Question 12 (a)

12 A spinner has five sides numbered 1 to 5.
If the spinner is fair, the probability that it lands on the number 1 is 0.2.

A student spins the spinner 300 times.

(a) Assuming the spinner is fair, use the information to work out how many times the spinner is expected to land on the number 1.

(a) ..... **[2]**

Most candidates successfully answered this question. Those who scored 1 mark often made an arithmetic error in calculating 0.2×300, or calculated the correct value and then responded with it out of 300, such as $\frac{60}{300}$ or '60 out of 300'.

Of those candidates who did not score, common errors included $300 \div 2$, $300 \div 0.2$, or giving 0.2 as a fraction ($\frac{2}{10}$ or $\frac{1}{5}$).

Question 12 (b)

(b) The spinner actually landed on the number 1 on 58 of the 300 spins.

Decide whether or not the result suggests this spinner is likely to be a fair spinner?
Give a reason for your answer.

..... because .....

..... **[1]**

Most candidates did not correctly answer this. Those that were successful compared 58 to their answer to Question 12 (a), then responded about it being fair because the numbers are 'very close'. Less successful responses stated that for the spinner to be fair it must land on the number 1 exactly the same number of times as in Question 12 (a), or showed that 58 × 5 = 290 and not 300.

Question 13 (a) (i)

13 (a) Find the value of:

(i) 2^5,

(a)(i) ..... **[2]**

Many candidates successfully answered this question correctly. Most of those who were successful wrote out the calculation 2 × 2 × 2 × 2 × 2 = 32 in full.

Those who scored 1 mark wrote out the calculation correctly, but incorrectly evaluated it (e.g. 2 × 2 × 2 × 2 × 2 = 64).

A common misconception that resulted in no marks was to calculate 2 × 2 = 4 and then multiply this by 2 a further 5 times, thus calculating 2^6 rather than 2^5.

Another common misconception was that $2^5 = 10$.

Question 13 (a) (ii)

(ii) $\sqrt[3]{1000}$.

(ii) ..... **[1]**

Many candidates did not answer this correctly. A common error was to consider $\sqrt[3]{1000}$ as short division rather than a cube root, leading to 333[….]. Other incorrect answers included 100, 300 and 3000.

Question 13 (b)

(b) Simplify.

$y^{12} \div y^4$

(b) ..... **[1]**

Responses to this question were mixed. Higher performing candidates understood the relationship between the powers and successfully answered y^8.

Those who were less successful divided 12 by 4 to get y^3.

Question 13 (c)

(c) $5^p \times 5 = \frac{1}{5}$

Find the value of p.

(c) p = ... **[2]**

Many did not answer this question correctly. Those who attempted the question often converted $\frac{1}{5}$ to 0.2, which then made further progress more challenging.

Candidates who were successful were able to link $\frac{1}{5}$ to 5^{-1}. Those who did this yet could not link $5^p \times 5$ to $5^p \times 5^1$ scored 1 mark.

Question 14

14 Rosa is thinking of a fraction.
The numerator is a cube number less than 100.
The denominator is a square number less than 100.
The fraction is equivalent to $\frac{1}{8}$.

Find the fraction that Rosa is thinking of.

..... **[3]**

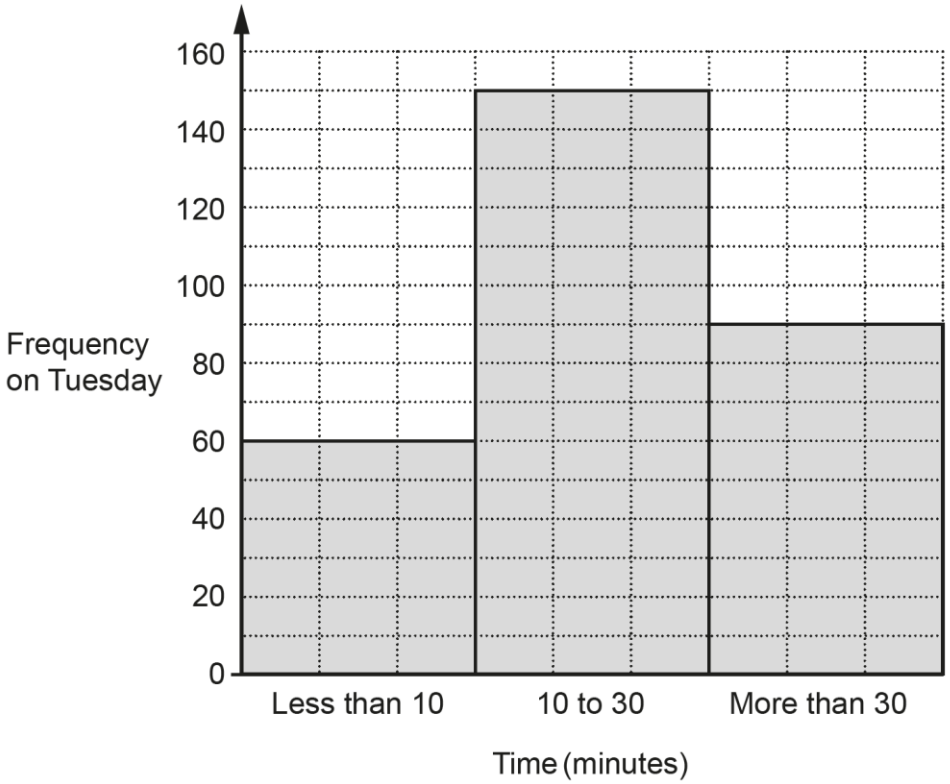
Around half the candidates were able to score a mark on this question. This question assessed understanding of cube numbers, square numbers and equivalent fractions.

Candidates showed a good understanding of square numbers and many were able to give a denominator that was a square number. Candidates were less successful however with cube numbers and 2, 3 or 10 were often given.

Candidates who were less successful often did not show their working clearly. Often multiple fractions were seen in the working, sometimes without any of them being clearly given as a final answer.

Question 15 (a)

15 The graph shows the time, in minutes, taken by some pupils to travel to school on **Tuesday**.



(a) Find the percentage of these pupils that took more than 30 minutes to travel to school.

(a) ..... % **[3]**

More than half of the candidates did not score any marks here. Successful candidates generally found the total number of pupils, then set up a fraction to arrive at a percentage ($\frac{90}{300} = \frac{30}{100} = 30\%$). A small number of candidates successfully calculated the percentage using the number of 'rectangles' in each bar ($\frac{27}{90} = 30\%$).

Less successful candidates could often identify that 90 pupils took more than 30 minutes, but were unable to proceed.

A common error was using 150 (the height of the tallest bar) as the total number of pupils.

Question 15 (b)

(b) On **Tuesday** the number of pupils taking 10 to 30 minutes to travel to school was 25% less than on Monday.

Find the number of pupils taking 10 to 30 minutes to travel to school on **Monday**.

(b) ..... **[3]**

Very few candidates successfully answered this question, not appreciating that it was a reverse percentage question.

The most common error was finding 25% of 150 (37.5) and then calculating 150 + 37.5 = 187.5.

Question 16

16 An electrician charges £30 per visit plus £22 per hour.

Write an expression for the cost, in £, charged by the electrician for one visit lasting n hours.

£ ..... **[2]**

Most candidates did not score any marks here. Those who were successful understood that the 22 was the hourly rate and so should be multiplied by n. The mark scheme condoned some poor notation for full marks and this was often seen with responses such as $30 + n \times 22$, $30 + n22$ and $n = 22n + 30$. Some candidates also included units in their answer, for example £30 + £22n.

Candidates who were not successful had often misunderstood the question and were looking for a numerical answer to the question, so answers such as 52, 74 or 96, etc. were common. Other common incorrect answers were $30n + 22$, $30n + 22n = 52n$ and $(30 + 22)n$.

Question 17

17 Anika has a shelf 79.6 cm long.
She has many books, each of width 3.4 cm.
Anika puts two paperweights, each of width 5 cm, and the maximum possible number of books on the shelf.

Work out the amount of space on the shelf that is left over.
You must show your working.

..... cm **[5]**

Many scored marks on this question. The numbers and calculations proved challenging, however many correctly showed the method they were following.

A small number of candidates did not complete 79.6 – 5 – 5, therefore were limited to achieving 3 marks through the alternative method given in the mark scheme. Of those who carried out this alternative method, there was an even mix between those that completed: $\frac{79.6}{3.4}$ and $\frac{79.6-5}{3.4}$.

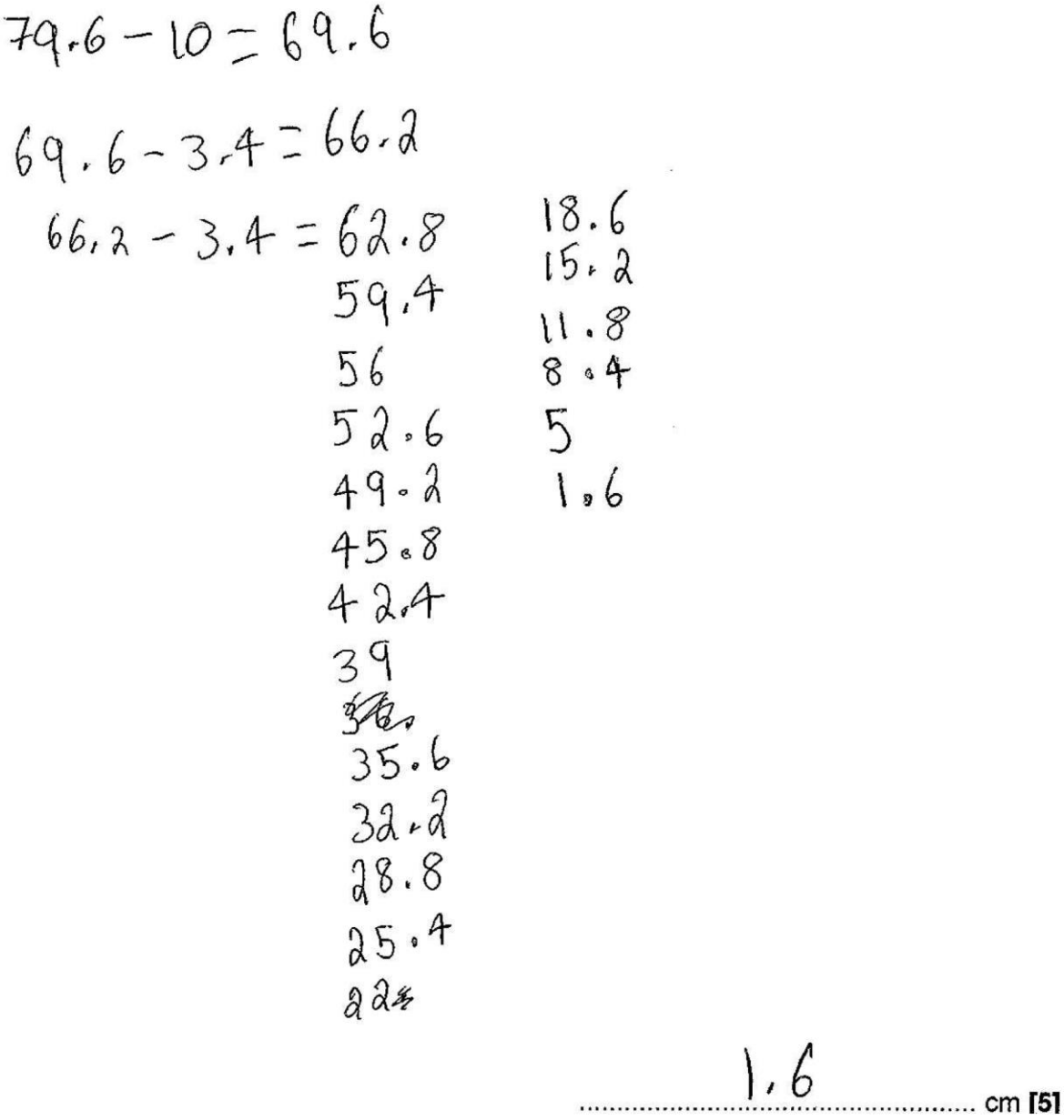
Throughout the question completing divisions such as: $\frac{69.6}{3.4}$ or $\frac{79.6}{3.4}$ was a challenge for candidates, especially if they were following a short division (or bus stop) method. It was however pleasing to report that many did spot that 79.6 ÷ 3.4 is equivalent to 796 ÷ 34. As a result of not being able to complete the short division, many candidates showed a variety of different methods including building up, repeated addition and repeated subtraction. In this question those who adopted repeated subtraction were usually successful.

Candidates who scored 3 marks had often thought the question was asking how many books can fit on the shelf, rather than the space that is left.

Candidates who did not score marks had generally made incorrect attempts to find the area of the shelf, or had calculated the left over space on the shelf when only one book was placed on it.

A small number of candidates achieved the 'correct' answer through wrong working such as 5 – 3.4 = 1.6. This was given 0 marks as the method is inappropriate.

Exemplar 2



The above exemplifies a very common method for Question 17.

The candidate shows 79.6 – 5 – 5 = 69.6.

Rather than dividing, the candidate then repeatedly subtracts 3.4 from 69.6 until they reach a value less than 3.4.

The candidate gives the correct answer and is given 5 marks.

Question 18

18 Jack has ten cards numbered 11 to 20.
He picks a card at random.

Jack says,

In these ten cards, there are two multiples of 5 and five even numbers.
Therefore, the probability that I pick a card that is a multiple of 5 or an even number is $\frac{2}{10} + \frac{5}{10} = \frac{7}{10}$.

Describe the error in Jack's method and give the correct answer.

The error is .....

.....

The correct answer is ..... **[2]**

Most candidates did not score any marks on this question.

Those who were successful explained that multiples of 5 can also be even numbers, often giving the example of 20.

Candidates who were less successful often stated that between 11 and 20 there would be only 9 cards, or that Jack had calculated $\frac{2}{10} + \frac{5}{10}$ correctly.

A significant proportion of candidates omitted this question.

Question 19 (a)

19 Felix makes craft figures at a constant rate.
He can make 5 craft figures in 40 minutes.

(a) Find the number of craft figures Felix can make in 4 hours.

(a) ..... **[3]**

Most candidates answered this question correctly. Two main methods were used. Candidates either found how long it takes to make 1 figure (8 mins) and then calculated $\frac{240}{8} = 30$, or they used a 'build-up method' of 5 figures = 40 mins, 10 figures = 1 hr 20 mins, etc. until they correctly reached 30 figures = 4 hours.

Those who were less successful often struggled with the time element of the question and could not convert 4 hours into minutes.

Question 19 (b)

(b) Darcie makes craft figures 10% quicker than Felix.

Work out how long Darcie takes to make 15 craft figures.

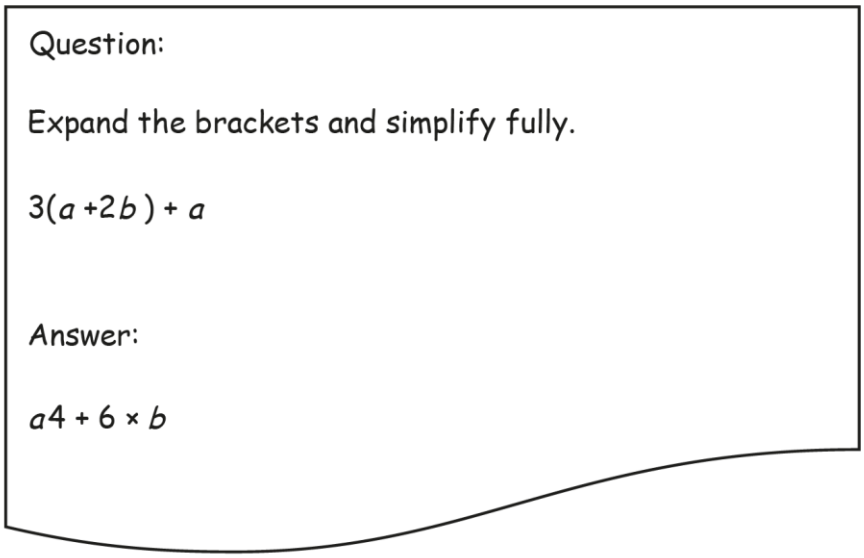
(b) ..... minutes **[3]**

Many candidates did not score any marks in this question, however most of those who were given marks scored the full 3 marks. The most common reason for candidates not scoring any marks was due to them finding 10% of the number of figures rather than the time. Some candidates struggled with the word 'quicker' and added the 10% of their time rather than subtracting it.

Those who scored 1 or 2 marks tended to have made arithmetic errors or had premature rounding (usually rounding 7.2 to 7) that then gave an inaccurate final value.

Question 20

20 Here is a question and an incorrect answer.



Explain why the answer is **not** correct.

.....

..... **[2]**

Most candidates did not score any marks in this question. Of those who did score, most scored 1 mark for correctly stating that the answer should be 4*a* + 6*b*.

The question asks candidates to explain why the answer is not correct, therefore reasons should be given as to why *a*4 + 6 × *b* is not the correct answer.

Less successful responses stated that *a*4 is a power, which is incorrect.

Very few candidates explained that in algebra, 6 × *b* should be written as 6*b*.

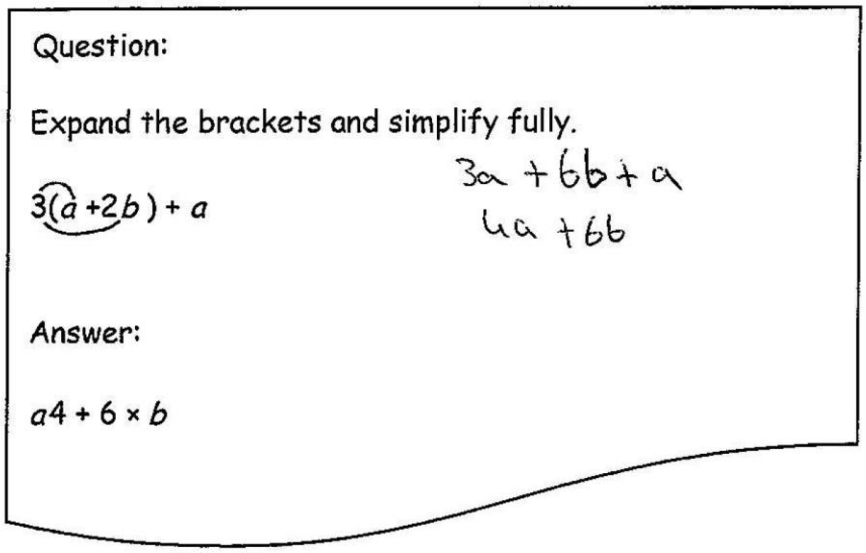
A small number of candidates were not specific enough and just stated that the error is the *a*4 or 6 × *b*. This is not enough as there is no explanation as to why these terms contain errors.

Key point: Explanation questions where candidates are expected to identify an error.

It is not unusual for 'Explain…' questions to ask candidates to explain why a given answer is incorrect. It is important that candidates clearly identify the error(s) and not just work out the correct answer. In the above example, stating that the correct answer is 4*a* + 6*b* is not fully answering the question.

Exemplar 3

20 Here is a question and an incorrect answer.



Explain why the answer is **not** correct.

The correct answer is 4a + 6b because 3 x a = 3a
3 x 2b = 6b and 3a + a = 4a. **[2]**

In this response the candidate shows that the correct answer is 4*a* + 6*b*.

It is important for candidates to understand that the question is specifically asking for an explanation of why the answer is not correct.

The response here scores 0 marks for the explanation, however the mark scheme here does award B1 for showing the correct answer.

Question 21 (a)

21 (a) Show that $(x+3)(x-5) = x^2 - 2x - 15$. **[1]**

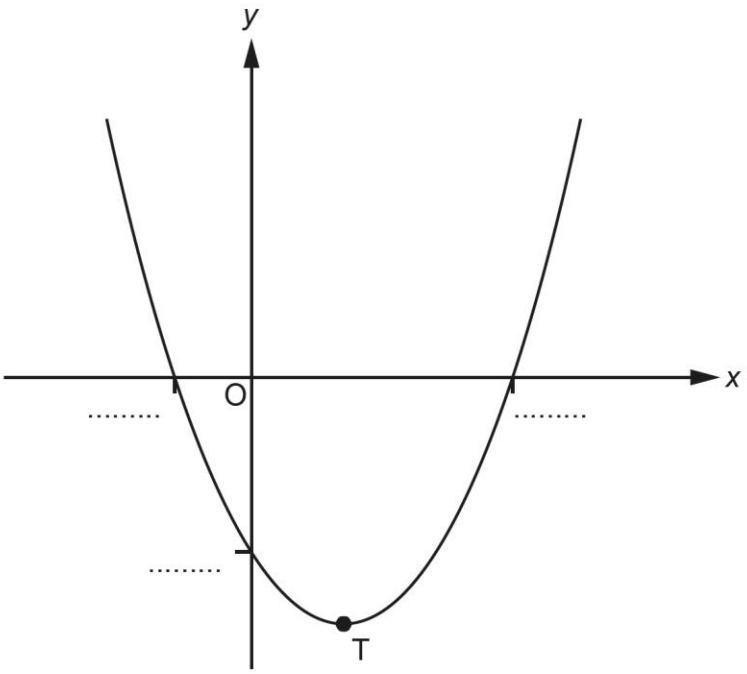
Most candidates were not able to clearly show this expansion.

The mark scheme expects candidates to show the correct 4 term expansion of the two brackets. Candidates often made errors by having incorrect signs for the coefficients.

This question was also omitted by a significant proportion of candidates.

Question 21 (b)

(b) The diagram shows a sketch of the graph $y = (x+3)(x-5)$.



Complete the diagram by adding the values of the **three** intercepts with the axes. **[2]**

A very small proportion of candidates gained marks in this question.

Most candidates did not link this part to Question 21 (a) and so did not use the information there to help them here.

Most candidates who did score gave the correct *y*-intercept of -15.

Those who gave answers for the *x*-intercepts tended to give -5 and 3.

This question was omitted by a significant proportion of candidates.

Question 21 (c)

(c) The minimum point on the graph is marked T.

Write down the coordinates of the point T.

(c) (..... , ...) **[2]**

A very small proportion of candidates gained marks in this question.

Where candidates scored one mark, it was for having the correct *x*-coordinate of 1. A small number of candidates did gain the follow through (FT) mark for their *x*-coordinate, however this was rare due to the large number of candidates who did not answer Question 21 (b).

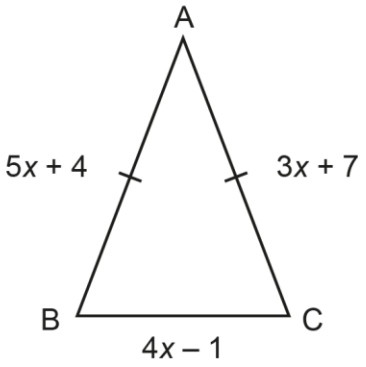
It was very rare to award a mark for the *y*-coordinate (either as ⁻16 or from the FT).

A very small number of high attaining candidates achieved the correct answer from using completing the square.

Question 22

22 In this question, all lengths are in centimetres.

The diagram shows an isosceles triangle ABC.
AB = AC.



Not to scale

Find the perimeter of the triangle.
You must show your working.

..... cm **[6]**

Candidates who attempted this question generally achieved at least one mark.

This question was challenging for most candidates, but those who scored did so in one of two ways. The most common was to find the sum of the three sides as an expression (this was given 1 mark). Some candidates however incorrectly equated this to 180.

The other way was to equate the two correct sides ($5x + 4 = 3x + 7$), which a small number of candidates did and this was also given M1. Some were then not able to solve this equation correctly, while those that did correctly find $x = 1.5$ often did not continue the question any further.

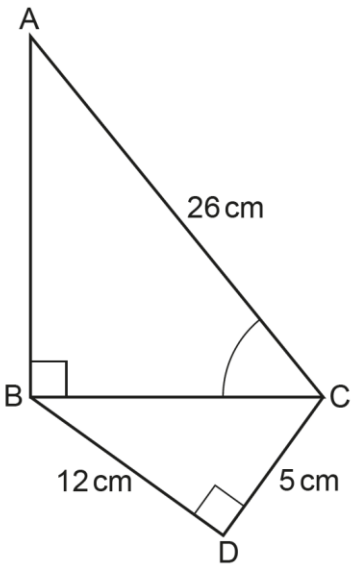
Of those candidates who did find a value for x, some summed the sides algebraically and then substituted their value for x, while others substituted it into all three sides and then added (some of these evaluated one or more of the expressions incorrectly and therefore lost marks).

A very small proportion of candidates attempted trials, but when they did so they often were unsure how to interpret their values and therefore subsequent trails appeared random.

It was very rare for candidates to be given the Special Case (SC) marks, which shows that generally candidates were showing sufficient workings.

Question 23

23 The diagram shows two right-angled triangles, ABC and BDC, joined at BC.



Not to scale

Work out angle BCA.
You must show your working.

..... ° **[5]**

A significant proportion of candidates found this question challenging.

Of those candidates who scored marks, it was either due to the correct use of Pythagoras' theorem or them scoring the Special Case (SC) mark for BC.

Those candidates who did correctly use Pythagoras' theorem to find BC often then struggled to fully show the trigonometry method to find angle BCA.

60 was a common answer, but was often obtained through an incorrect method (e.g. 5 × 12). This did not score the Special Case (SC) mark.

Supporting you

Teach Cambridge

Make sure you visit our secure website **Teach Cambridge** to find the full range of resources and support for the subjects you teach. This includes secure materials such as set assignments and exemplars, online and on-demand training.

Don't have access? If your school or college teaches any OCR qualifications, please contact your exams officer. You can forward them this link to help get you started.

Reviews of marking

If any of your students' results are not as expected, you may wish to consider one of our post-results services. For full information about the options available visit the OCR website.

Access to Scripts

We've made it easier for Exams Officers to download copies of your candidates' completed papers or 'scripts'. Your centre can use these scripts to decide whether to request a review of marking and to support teaching and learning.

Our free, on-demand service, Access to Scripts is available via our single sign-on service, My Cambridge. Step-by-step instructions are on our website.

Keep up-to-date

We send a monthly bulletin to tell you about important updates. You can also sign up for your subject specific updates. If you haven't already, sign up here.

OCR Professional Development

Attend one of our popular professional development courses to hear directly from a senior assessor or drop in to a Q&A session. Most of our courses are delivered live via an online platform, so you can attend from any location.

Please find details for all our courses for your subject on **Teach Cambridge**. You'll also find links to our online courses on NEA marking and support.

Signed up for ExamBuilder?

ExamBuilder is a free test-building platform, providing unlimited users exclusively for staff at OCR centres with an Interchange account.

Choose from a large bank of questions to build personalised tests and custom mark schemes, with the option to add custom cover pages to simulate real examinations. You can also edit and download complete past papers.

Find out more.

Active Results

Review students' exam performance with our free online results analysis tool. It is available for all GCSEs, AS and A Levels and Cambridge Nationals (examined units only).

Find out more.

You will need an Interchange account to access our digital products. If you do not have an Interchange account please contact your centre administrator (usually the Exams Officer) to request a username, or nominate an existing Interchange user in your department.

Need to get in touch?

If you ever have any questions about OCR qualifications or services (including administration, logistics and teaching) please feel free to get in touch with our customer support centre.

Call us on
01223 553998

Alternatively, you can email us on
support@ocr.org.uk

For more information visit
ocr.org.uk/qualifications/resource-finder
ocr.org.uk
facebook.com/ocrexams
twitter.com/ocrexams
instagram.com/ocrexaminations
linkedin.com/company/ocr
youtube.com/ocrexams

We really value your feedback

Click to send us an autogenerated email about this resource. Add comments if you want to. Let us know how we can improve this resource or what else you need. Your email address will not be used or shared for any marketing purposes.

I like this **I dislike this**

Please note – web links are correct at date of publication but other websites may change over time. If you have any problems with a link you may want to navigate to that organisation's website for a direct search.

CAMBRIDGE
UNIVERSITY PRESS & ASSESSMENT