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OCR
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GCSE (9-1)

Examiners' report

MATHEMATICS

J560
For first teaching in 2015

J560/02 November 2018 series

Version 1

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 and highlight good performance and where performance could be improved. The reports will also explain aspects which 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 can be downloaded from OCR.

Paper J560/02 series overview

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

The paper was appropriate with very few candidates scoring more than 70, indicating that the majority of candidates had been entered at an appropriate level and that the paper was sufficiently challenging. The number of instances where no response was offered was very low with just 4 question parts proving too challenging for 20–30% of candidates to attempt. Therefore, the questions were accessible to the majority of candidates and allowed them the opportunity to demonstrate their mathematical skills. There was little evidence indicating that candidates ran out of time.

Good working was shown by many, however for some candidates, especially on longer questions, working was not approached in an organised manner. With calculations dotted all over the page methods can be difficult to follow. Responses benefit from being set out in a logical, step-by-step way in order to score effectively.

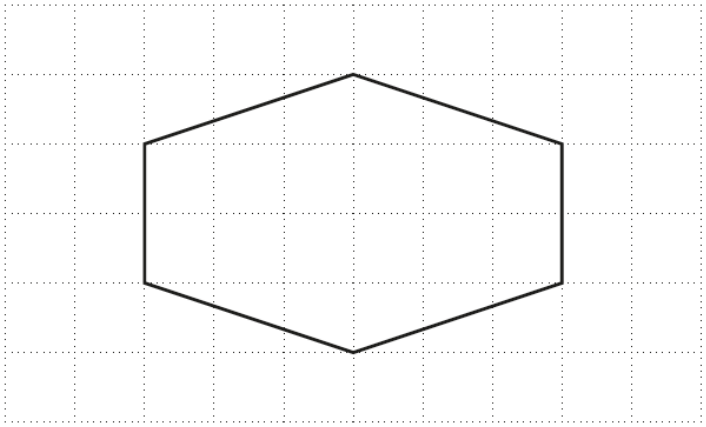
It is clear that errors in basic arithmetic calculations lost accuracy marks after correct methods were seen so some straightforward marks were lost. Some candidates continue to write numbers in a division the wrong way around.

Candidates generally paid attention to what was required on the answer line and did not add units if they were already there. Questions requiring a sentence of explanation were problematic for a significant number of candidates.

Topics that proved difficult and are therefore areas for development of understanding: working with fractions (Q2), equations of graphs (Q10), combining ratios (Q11), division by decimals and estimation (Q12), expanding and factorising quadratics (Q15), and algebraic area of a circle (Q21).

Question 1(a)

1 Here is a hexagon.



(a) On the diagram, draw the hexagon's two lines of symmetry. **[1]**

This was usually correct although some candidates gave diagonal lines.

Question 1(b)

(b) Write down the order of rotation symmetry of the hexagon.

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

This was less well answered than part (a). An answer of 4 was a common error, and directions and degrees such as 90° clockwise were often seen.

Question 2(a)

2 Work out.

(a) $\frac{1}{2}$ of 12

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

Most candidates answered this question very well with just a handful of errors seen, commonly 24 or $\frac{1}{24}$. Others showed the division by 2 while a few gave 12 ÷ 2 = 6 × 1 = 6 or even a formal fraction calculation of $\frac{1}{2} \times \frac{12}{1} = \frac{12}{2} = \frac{6}{1}$.

Question 2(b)

(b) $8 \times \frac{1}{5}$

Give your answer as a mixed number.

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

Few candidates knew how to express a whole number as a fraction. Those that successfully multiplied a number and a fraction mostly left their answer as $\frac{8}{5}$. Some changed the fraction to a decimal and although they multiplied correctly they left their answer in decimal form. Some multiplied both numerator and denominator by 8, to give $\frac{8}{40}$ while others inverted the $\frac{1}{5}$ and worked with $8 \times \frac{5}{1}$. Some showed $8 \times 5 + 1 = \frac{41}{5} = 8\frac{1}{5}$ or simply joined the parts together to give $8\frac{1}{5}$.

Question 2(c)

(c) Isaac and Maya eat part of a pizza.

Isaac eats $\frac{1}{6}$ of the pizza.

Maya then eats $\frac{3}{5}$ of the **remaining** pizza.

What fraction of the original pizza is left?

(c) ..... **[4]**

This proved a most challenging question. The most successful method was using a diagram, shading $\frac{1}{6}$ of a pizza, then shading another 3 parts for the $\frac{3}{5}$ leading to the correct answer of $\frac{2}{6}$. Others subtracted parts of the pizza using whole numbers. Many misinterpreted the question but gained SC marks as they stated that Isaac had eaten $\frac{1}{6}$, Maya had eaten $\frac{3}{5}$, so these fractions were added and the result subtracted from 1. Often a common error in this case was $\frac{1}{6} + \frac{3}{5} = \frac{4}{11}$. Some candidates identified two pieces were left but wrote $\frac{2}{5}$ without previous working or explanation. There were many answers of $\frac{23}{30}$ or $\frac{7}{30}$ and a common error was $\frac{18}{30} - \frac{5}{30} = \frac{13}{30}$.

Exemplar 1 2 marks

(c) Isaac and Maya eat part of a pizza.

Isaac eats $\frac{1}{6}$ of the pizza.

Maya then eats $\frac{3}{5}$ of the **remaining** pizza.

What fraction of the original pizza is left?

$\frac{1}{6} + \frac{3}{5}$

$= \frac{5+18}{30}$

$= \frac{23}{30}$

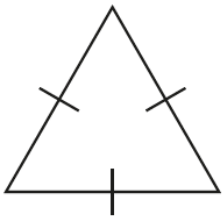
$\therefore \frac{30}{30} - \frac{23}{30} = \frac{7}{30}$

(c) $\frac{7}{30}$ **[4]**

Here the candidate misinterpreted the question but gained 2 SC marks for demonstrating a good ability to add and subtract fractions using a common denominator.

Question 3(a)

3 **(a)** Complete the statement using a term from the list.



isosceles	equilateral	right-angled	scalene

The triangle is ..... **[1]**

This question was well answered although isosceles was often seen.

Question 3(b)(i)

(b) These are the names of some special quadrilaterals.

rectangle	parallelogram	
trapezium	kite	rhombus

Choose a quadrilateral from the list that satisfies each set of conditions.

(i)
- All four sides are the same length.
- Opposite angles are equal.

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

This was less well answered than part (a) with parallelogram and kite common incorrect answers.

Question 3(b)(ii)

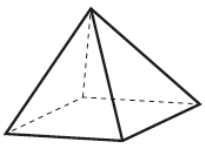
(ii)
- All four angles are right angles.
- Opposite sides are equal.

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

This part was more successful. Candidates who sketched the figures had the best strategy.

Question 3(c)

(c) This is a square based pyramid.



Complete the following.

A square based pyramid has ..... faces and ..... edges. **[2]**

There were many fully correct answers. Number of edges caused more problems than number of faces with 5 faces and 5 edges a common answer.

Question 4(a)(i)

4 These are the heights, in metres, of the players in a netball team.

1.30 1.13 1.20 1.23 1.22 1.24 1.15

(a) (i) Find the median height of the 7 players.

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

Generally, candidates were completely correct in their understanding of the mean, median and range. In this part, many were fully correct with suitable ordering and striking out of values seen as working. Occasionally some did not order the list and identified 1.23 as the median.

Question 4(a)(ii)

(ii) Work out the range of the heights of the 7 players.

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

Most candidates knew to subtract the smallest from the biggest value. As a result many earned full marks but a significant number made errors in their subtraction; common answers in these cases were 1.17 and 0.27. Some who worked in centimetres did not convert back to metres. Occasionally the reversed subtraction, 1.13 – 1.30, was seen.

Question 4(a)(iii)

(iii) The sum of the heights of the 7 players is 8.47 m.

Calculate the mean height of the 7 players.

(iii) ..... m **[2]**

Most candidates knew to divide the total of their heights by 7 and many earned full marks, but errors came from attempts at division. A significant number of candidates added the given values to find the total even though they had been given 8.47 in the question. A small number multiplied 8.47 by 7.

Question 4(b)

(b) The tallest player is replaced by a substitute.
The median height of the players is unchanged.
The mean height of the players becomes smaller.

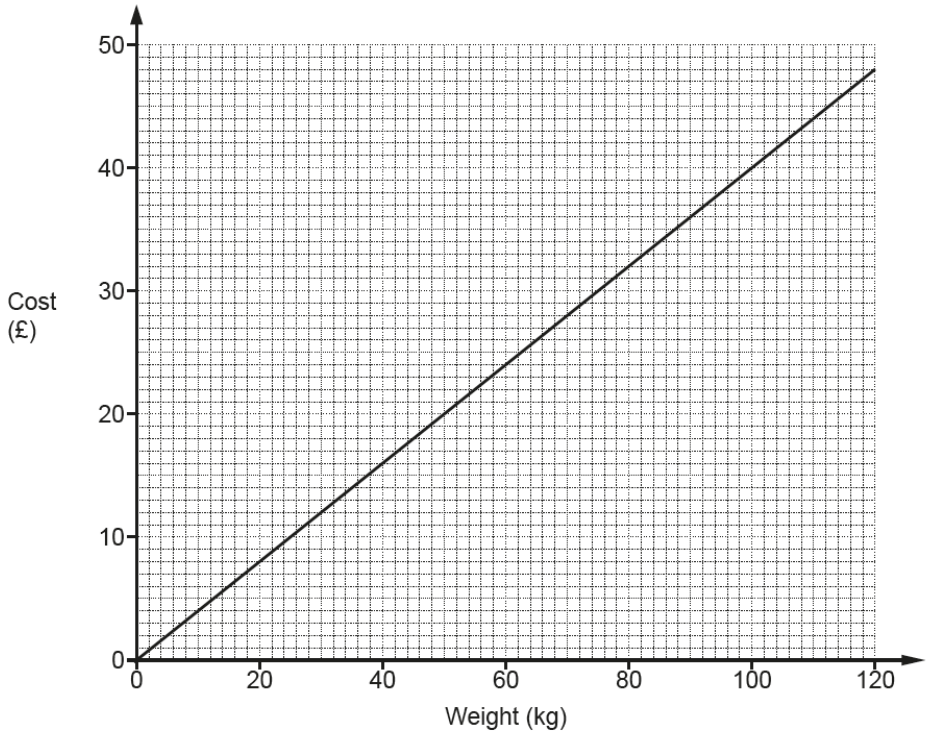
Write down a possible height for the substitute.

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

Answers were often given without working and were usually less than 1.30. Those who had a value less than 1.22 generally did not show supporting work for the M1 mark.

Question 5(a)(i)

5 This graph shows the cost of buying potatoes from a farm.



(a) (i) How much does it cost to buy 70 kg of potatoes?

(a)(i) £ ..... **[1]**

The correct conversion of 70 kg to £28 was often seen.

Question 5(a)(ii)

(ii) What weight of potatoes can be bought for £38?

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

This was less successfully attempted. When correct, the answer was frequently 94 or 96 kg rather than 95. Common errors came from inconsistent scale reading: 98 from placing 90 correctly but then reading the scale incorrectly between 90 and 100; 87 caused by reading all of the scale incorrectly from 80 to 100. Occasionally an answer of 12 came from working out the cost of 38 kg.

Question 5(a)(iii)

(iii) The cost per kilogram of potatoes is the same for any weight of potatoes.

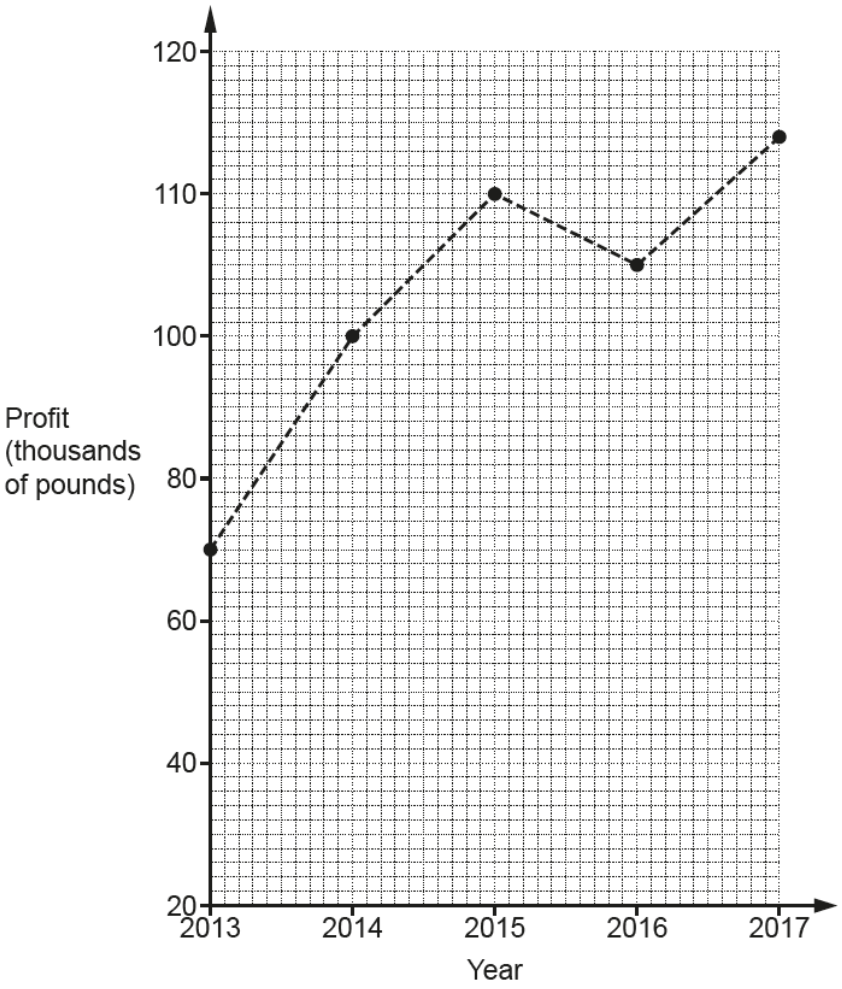
How much will it cost to buy 180 kg of potatoes from the farm?

(iii) £ ..... **[3]**

Lots of methods were used to extrapolate and find the answer. The most successful candidates found costs for 120 kg + 60 kg or stated the cost for 90 kg and doubled. Hence answers of 72 were common. Errors came from approximating that 10 kg cost £5 or 20 kg cost £10. Other errors arose from incorrect reading of values, in particular 120 kg was read off as £50 or £58. Adding in horizontal and vertical lines often did not help as they were slightly sloping. A common method that often produced errors was 120 kg + 20 + 20 + 20.

Question 5(b)

(b) This graph shows the annual profits, in thousands of pounds, of the farm between 2013 and 2017.



Describe one misleading feature of the graph.

.....

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

Many candidates identified one of the two errors, the missing zero or the non-linear scale. Non-scoring comments referred to the plotted points and line graph. A common error was to comment on the dip in the line in 2016 while others thought all the months should be shown.

Question 6

6 Which is bigger, 36% or $\frac{7}{20}$?

Show your working and give a reason for your answer.

..... is bigger because .....

..... **[4]**

A good proportion of candidates successfully converted $\frac{7}{20}$ to either 35% or 0.35, the former allowing a clear comparison to the 36% given. Many attained at least B1 by writing a correct conversion of 36%, usually as either 0.36 or $\frac{36}{100}$. Common errors were to cancel $\frac{36}{100}$ to $\frac{9}{25}$ and compare this with $\frac{7}{20}$ even though the denominators differed. For others, in attempting to convert $\frac{7}{20}$ to a decimal, they used the bus stop method to divide 20 by 7. This error led to many candidates suggesting that $\frac{7}{20}$ = 28%.

Question 7(a)

7 **(a)** Write down the value of $\sqrt[3]{27}$.

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

Often treated as a division, the most common answer was 9. A few who got to 3 gave the answer 3 × 3 × 3.

Question 7(b)

(b) Work out 7^2.

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

This was very well answered with many reaching 49. Candidates frequently knew to do 7 × 7 but often got this calculation wrong e.g. 14, 42 or 48.

Question 7(c)

(c) Write 6^{-1} as a fraction.

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

This proved difficult for all but a few candidates. Common errors were $\frac{1}{6}$ or $\frac{6}{-1}$, an extra power to the 1 left in, $\frac{5}{6}$ or $\frac{6}{100}$.

Question 8

8 A water company charged the following in 2017.

£2.00 for each m^3 of water used
plus
a fixed charge of £45

In 2017 Jenny used 110 m^3 of water.
For the 12 months of 2017 she paid £20 per month to the water company.

How much more money does Jenny need to pay to the water company?

£ ..... **[6]**

Candidates scoring full marks, in the main, set out their working clearly and efficiently with the figures 220, 45 and 265, and 240 seen. Many candidates gained 4 marks for reaching the values of 240 and 220 but some made the error of adding them together. A number of candidates were unsure how to use the fixed charge of £45 in their calculation, often adding it to 240. They then subtracted 220 to give a final answer of 65. Another error was to think the fixed charge was a monthly cost and so calculations of 45 × 12 were seen. Errors in multiplication of 2 × 110 often resulted in 240 and some candidates thought they needed to divide 110 by 2.

Question 9(a)

9 **(a)** Rearrange this formula to make x the subject.

$$y = x - 2$$

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

In both parts of this question, some candidates did not include the "subject" e.g. in this part they just stated $y + 2$. Other common errors were $x = y - 2$ and $x = 2y$ or candidates just swapped the sides to give $x - 2 = y$.

Question 9(b)

(b) Rearrange this formula to make d the subject.

$$C = \pi d$$

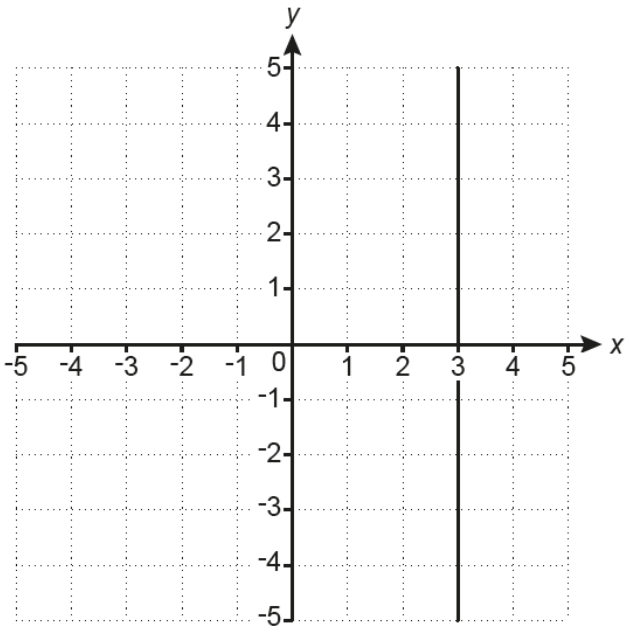
(b) ..... **[1]**

This was less successful than part (a). Common errors of $d = \frac{\pi}{c}$ or $d = \pi c$ were often seen.

Question 10(a)(i)

10 (a) Write down the equation of each of these lines.

(i)

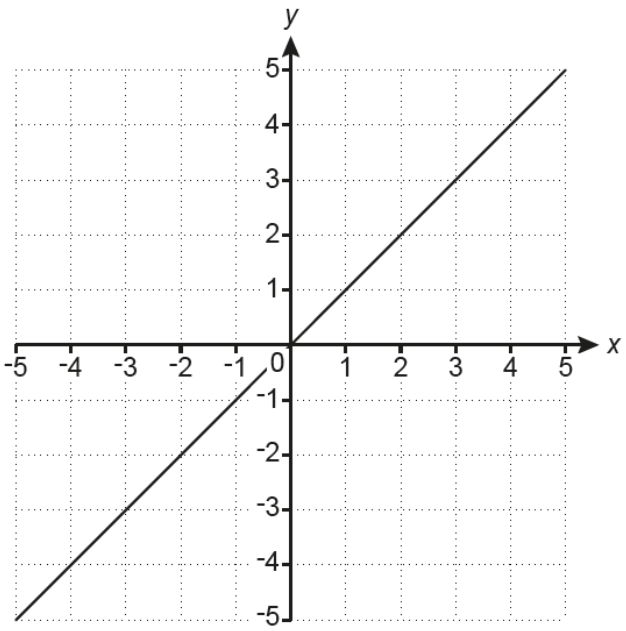


(a)(i) ..... **[1]**

The most common answer was $y = 3$. Other attempts varied greatly between the correct answer, $x3$, $y3$, and answers in the form $y = mx + c$, most commonly $y = x + 3$. A few gave coordinates of a point on the line.

Question 10(a)(ii)

(ii)

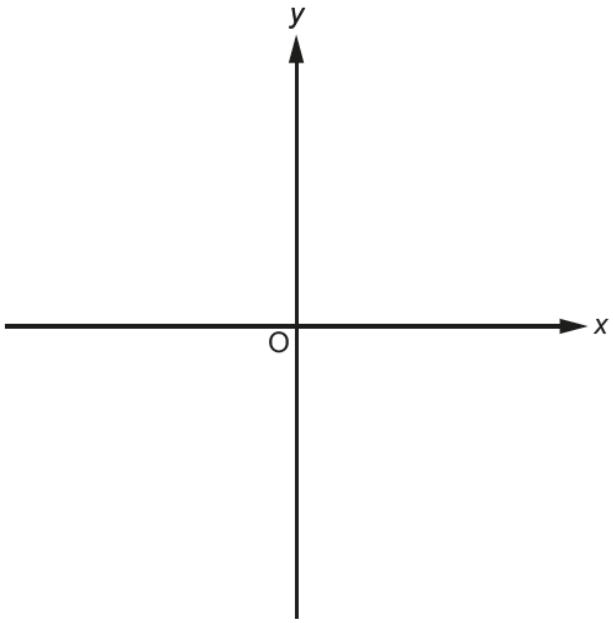


(ii) ..... **[1]**

Very few answers were correct in this part. $xy = 0$ was a common error along with a variety of $x =$ and $y =$ equations. As with part (a)(i) some candidates stated a coordinate.

Question 10(b)

(b) Sketch the graph of $y = x^2$.



[1]

Correct answers or any non-linear graphs were very rarely seen. When a U-shaped quadratic graph was seen it rarely passed through the origin. Some candidates just numbered the axes. A few attempted to use a table of values to plot a graph but rarely succeeded.

Question 11

11 Some biscuits contain only three ingredients: flour, butter and sugar.

- The ratio of flour to butter is 5 : 4.
- The ratio of butter to sugar is 2 : 1.
- The total weight of the flour, butter and sugar is 770 g.

Work out the weight of each of the ingredients.

Flour ..... g

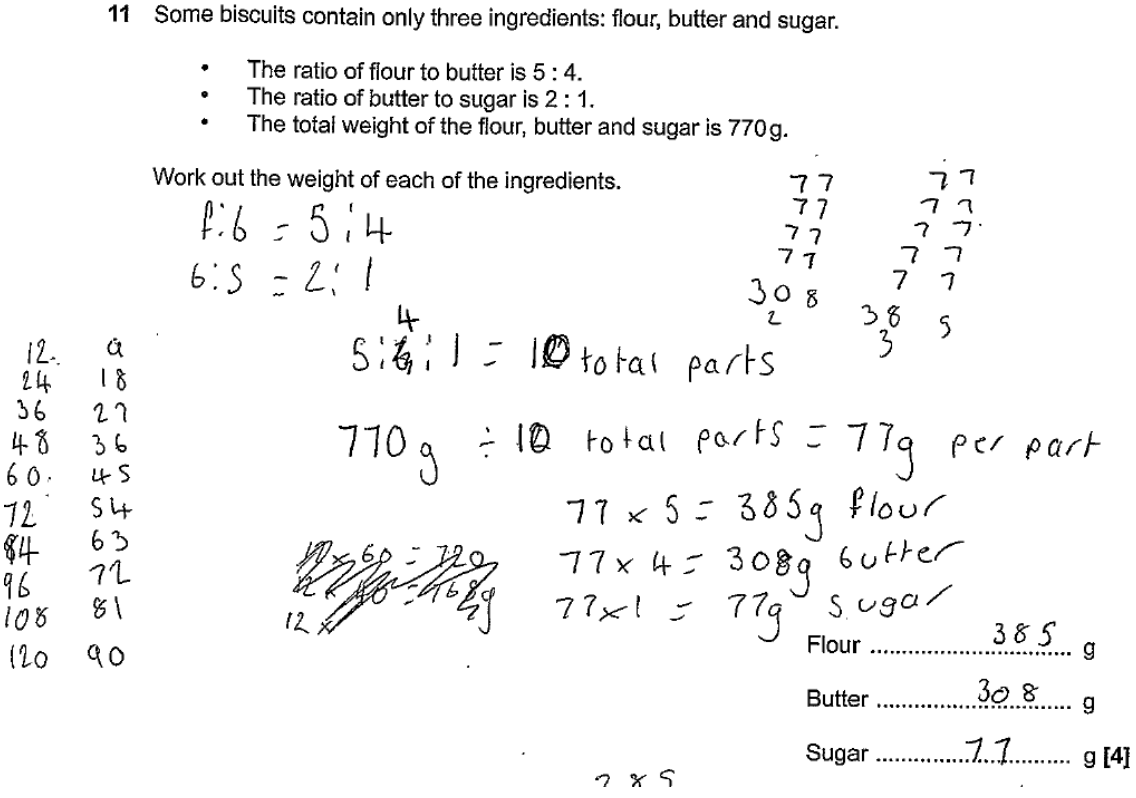
Butter ..... g

Sugar ..... g **[4]**

This question proved to be too difficult for many candidates. Most were unable to combine the two ratios and so divided 770 by both 9 and 3. Those that attempted to work with 5 : 4 : 2 : 1 could not see how only 3 answers were obtained. Others who added the two ratios to reach 5 : 6 : 1 gained marks if they went on to divide 770 by 12 and then multiply that answer by 5. However, correct divisions and multiplications were not often seen and rounding was common. Often, working was scattered all over the page making it difficult to follow a candidate's method.

Exemplar 1

2 marks



The ratios have not been correctly combined as the candidate has given 5 : 4 : 1 instead of 5 : 4 : 2. However, following through from this error, they have earned an M1 for 770 ÷ *their* (5 + 4 + 2) and a second M1 for 5 × *their* 70 (or 4 × *their* 70 or 2 × *their* 70).

Question 12(a)

12 (a) Work out.

$8 \div 0.4$

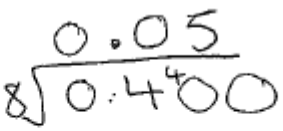
(a) ..... **[2]**

Few candidates demonstrated the strategy of multiplying both parts by 10 to change the question into 80 ÷ 4. Some attempted repeated addition of 0.4 to reach 8 but were not always successful. A common error was 8 ÷ 4 = 2 giving an answer of 2, or moving the decimal place the wrong way to give an answer of 0.2. Others attempted to calculate 0.4 ÷ 8.

Exemplar 1 0 marks

12 (a) Work out.

$8 \div 0.4$



(a) 0.05 **[2]**

This exemplar is included to highlight a very common error made by candidates. They have written the bus stop method the wrong way round and have therefore found the correct answer to 0.4 ÷ 8 rather than 8 ÷ 0.4.

Question 12(b)

(b) By writing each number correct to 1 significant figure, find an estimate for this calculation.

$$\frac{22.1 \times 37}{1.9}$$

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

The majority of candidates approximated 1.9 to 2 but 22.1 was usually rounded to the nearest whole number rather than 1 significant figure. This led to many calculating 22 × 37 with a very common answer of 407. Others also rounded 37 to 1 significant figure giving (22 × 40) ÷ 2 = 440. Both of these solutions earned just 1 mark. Those who rounded all numbers to the correct degree of accuracy usually reached 400 but a few thought 20 × 40 was 80. Many candidates spent a lot of valuable time on unnecessary long multiplication and long division.

Question 13(a)

13 (a) Write 0.003 16 in standard form.

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

Candidates usually had the figures 316 in their answer but not always × 10^x. Common errors were 316 × 10^{-5} or 10^5. Other answers seen which demonstrated some understanding of standard form were 3 × 10^{-3}, 3.16 × 10^{-4} and 3.16 × 10^3.

Question 13(b)

(b) Work out.

$$2 \times 10^2 \times 4 \times 10^5$$

Give your answer in standard form.

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

Many candidates showed a lot of working out in the answer space. A noticeable number attempted to add parts of their answer instead of multiplying so 8 was sometimes replaced by 6. Others wrote the numbers out in full and attempted to combine them rather than using rules for indices. 8×10^3, from using the incorrect indices rule, was sometimes seen.

Question 14(a)

14 The next term in each of these Fibonacci sequences is found by adding together the two previous terms.
Work out the missing terms in each sequence.

(a) 2 5 7 12 .... **[1]**

This part was usually correct. Most candidates were able to find 19 and 31 but there were occasional errors in addition usually giving 21 as the second missing term. A small number of candidates missed the instruction given to complete the sequence and looked for a pattern, coming up with 15 and 17.

Question 14(b)

(b) .... 22 34 **[2]**

Many candidates did well gaining either full marks or B1, usually for 12 as the third term. A common error was recognising the difference of 12 between the two given numbers and then using that as a common difference giving, -14, -2 and 10.

Question 15(a)

15 (a) Multiply out.

$$(3x-2y)(x+y)$$

Give your answer in its simplest form.

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

Some knowledge of multiplying brackets was demonstrated but many candidates were unable to obtain the correct signs for the terms. Often negative signs were ignored so all terms in an answer were positive. A common error was not multiplying out all terms, often leading to an answer of $3x^2 - 2y^2$. Where candidates worked out four correct terms, collecting them often lead to errors such as $3xy - 2yx = 5xy$ or ^-5xy.

Exemplar 1 2 marks

15 (a) Multiply out.

$(3x-2y)(x+y)$

Give your answer in its simplest form.

$3x^2+3xy-2yx-2y^2$

$3x^2$

(a) $3x^2-xy-2y^2$ **[3]**

In this example, all four terms have been stated correctly and M2 is scored at this stage. In simplifying the 2 middle terms, 3xy and ^-2yx, the candidate has made a sign error and therefore the final mark is lost.

Question 15(b)

(b) $3(2x+d)+c(x+5)=10x+17$

Work out the value of c and the value of d.

(b) $c =$ .....

$d =$ ..... **[5]**

Candidates that were able to correctly expand the brackets often did not know how to proceed further. Others managed to obtain $c = 4$ but then often went on to state $d = 12$ or $d = -3$. It was very rare to see both values for c and d correct. The main error when attempting to expand brackets was not multiplying the second term, giving $6x + d$ and $cx + 5$.

Question 15(c)

(c) Solve by factorising.

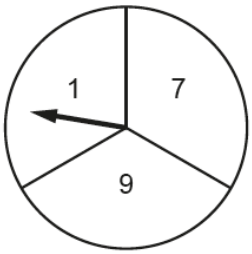
$$x^2 - 7x + 10 = 0$$

(c) $x =$ ..... or $x =$ ..... **[3]**

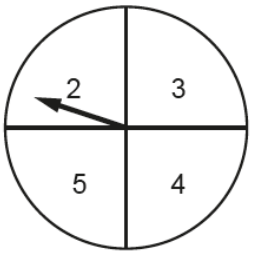
The vast majority of candidates did not try to solve by factorisation. Where brackets were seen, two factors were often not given. Those who wrote factors often showed evidence of looking for product = 10 and sum = -7, but commonly came up with $(x - 5)(x + 2)$ and answer $x = -5$ and $x = 2$.

Question 16(a)

16 Geoff has two fair spinners.



Spinner A



Spinner B

He spins both spinners and **multiplies** the numbers on each spinner.

(a) Complete the table.

		Spinner A		
	×	1	7	9
Spinner B	2	2	14	18
	3	3	21	27
	4	4	28	
	5	5	35	

[1]

Most candidates were able to find 36 and 45, and very few errors were seen.

Question 16(b)

(b) Geoff wants to work out the probability that the outcome of the multiplication is an even number or a prime number.
Here is his working.

The probability the outcome is an even number is $\frac{6}{12}$.

The probability the outcome is a prime number is $\frac{3}{12}$.

The probability the outcome is an even number or a prime number is $\frac{6}{12}+\frac{3}{12}=\frac{9}{12}$.

Geoff is wrong.
Explain his error and give the correct answer.

.....

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

It was rare to see a correct reason and few candidates gave the correct value. The majority offered an explanation as to why the answer was incorrect but often an alternative answer was not stated. The most common misconceptions were that the error came from the calculation of $\frac{6}{12}+\frac{3}{12}$ due to not adding the denominators correctly, or to dispute the number of even/prime numbers in the table. 2 was often dismissed as a prime number.

Question 17(a)

17 The depth of water in a garden pond is 57.8 cm.
The depth decreases by 0.3 cm per day.

(a) Assume the depth continues to decrease at the same rate.

After how many days will the depth reach 54.2 cm?

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

Many candidates reached the correct answer but mainly from repeated subtraction of 0.3.Very few approached the problem by subtracting the two values to enable the division. Quite a number of candidates miscounted their number of subtractions giving an answer of, most commonly, 13.

Question 17(b)

(b) If the depth of water decreases at a slower rate, what effect will this have on your answer to part **(a)**?

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

This part was well done with only a few candidates thinking that the number of days reduced. Others stated their calculation was wrong or their answer was wrong without explaining why.

Question 18

18 Emily spent £2400 on holiday in 2017.
This was 20% more than she spent on holiday in 2016.

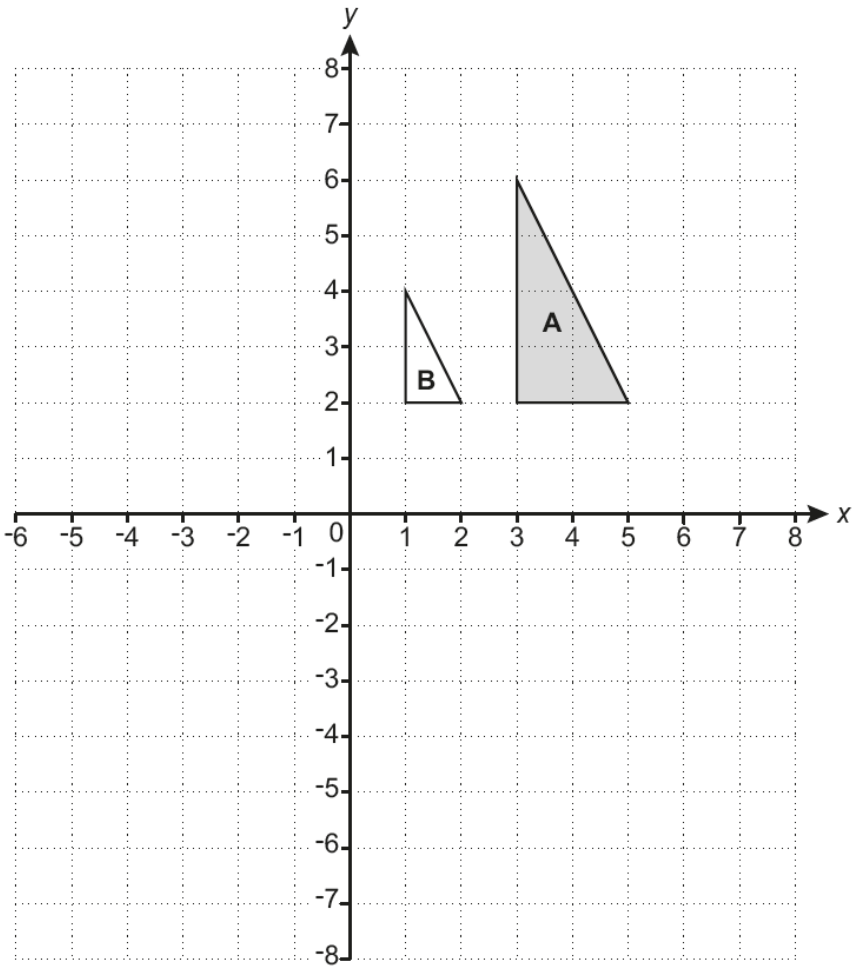
Calculate the amount she spent on holiday in 2016.

£ ..... **[3]**

Almost all candidates did not recognise this as a reverse percentage problem. Most attempted to increase or decrease 2400 by 20% with some finding 80%. 1920 was a very common answer. On the rare occasion 2400 was recognised as representing 120%, candidates were generally unable to proceed beyond this. Very few candidates scored full marks; this was mostly achieved by these candidates choosing 2000 and checking that adding 20% gave 2400.

Question 19(a)(i)

19 Triangle **A** and triangle **B** are drawn on the coordinate grid.



(a) (i) Draw the image of triangle **A** after a rotation of 180° about (0, 0). **[2]**

For many candidates, the rotation was completed more successfully than the translation. In part (a)(i) many correct triangles were seen and quite a few candidates gained M1 for a correctly orientated triangle that was incorrectly placed. A common error was to rotate triangle **A** by 90°.

Question 19(a)(ii)

(ii) Draw the image of triangle **A** after a translation by the vector $\begin{pmatrix} 2 \\ -7 \end{pmatrix}$. **[2]**

There were few correct answers seen and M1 was rarely credited. A common error was to plot the right-angled vertex at the point (2, -7) and then complete the correct sized and orientated triangle. Others translated left 2 and up 7.

Question 19(b)

(b) Describe fully the **single** transformation that maps triangle **A** onto triangle **B**.

.....

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

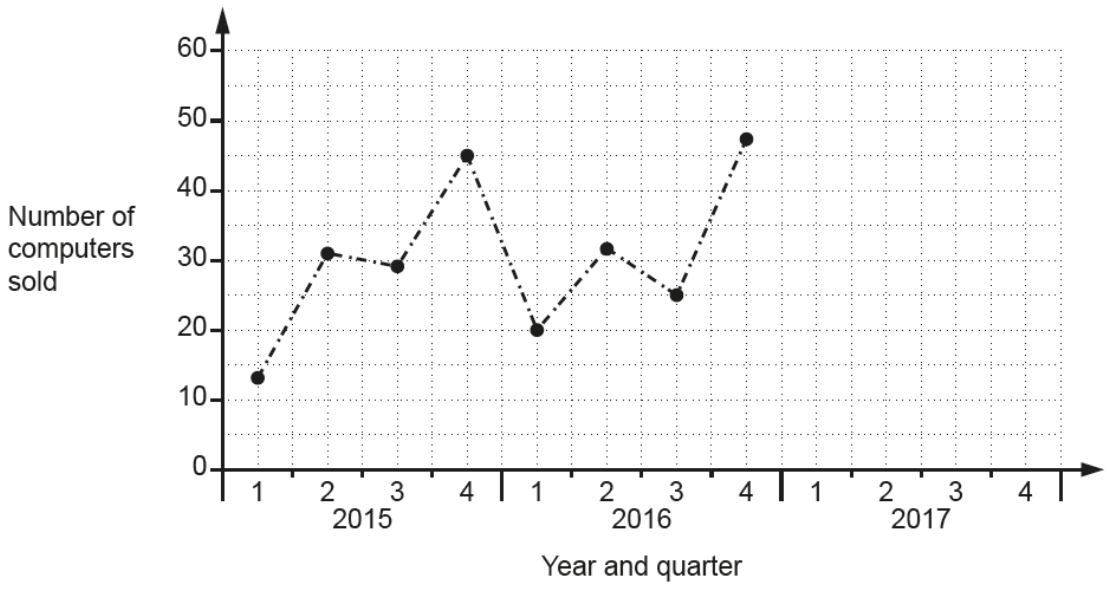
Part (b) was not well answered. Some candidates gained B1 for enlargement. Very few stated $\frac{1}{2}$ for the scale factor, most said it had doubled, and the centre of enlargement was rarely referred to. Many did not state enlargement but said the triangle had reduced in size or halved.

Question 20(a)

20 The table shows the number of computers sold in Tom's shop each quarter from 2015 to 2017.

	2015				2016				2017			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4
Number of computers sold	13	31	29	45	20	32	25	47	27	40	30	58

(a) Complete this graph using the information for 2017.



[2]

Plotting of points was often accurate. Errors came from inaccuracy of plotting heights or plotting the correct heights in the wrong position, commonly the last point was plotted one square to the right.

Question 20(b)

(b) Tom adds the three results for quarter 1 and he adds the three results for quarter 4.
Tom says

The ratio of the **total** number of computers sold in quarter 1 compared to quarter 4 is 2 : 5.

Is he correct?
Show your reasoning.

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

Many totals of 60 and 150 were seen but quite a number of candidates followed correct working with the decision 'No' or did not give any decision. Incorrect conclusions often came from incorrect addition, usually of the quarter 4 values. Others did not understand that they were required to add the three values for quarter 1 and the three values for quarter 4. Other errors came from adding 60 and 150 or incorrectly cancelling the ratio 60 : 150 so therefore not finding it would simplify to 2 : 5.

Question 20(c)

(c) Make two comments about Tom's sales over the period 2015 to 2017.

Comment 1 .....

.....

Comment 2 .....

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

Very few candidates managed to give two scoring statements. Many lost a mark as both comments referred to seasonal only or overall only. The overall comment was the source of most marks scored. "They have increased" referring to sales was often seen. The seasonal comment caused more problems with candidates often only referring to one quarter of one year. Non-scoring statements included specific years rather than the overall or seasonal trends. Values for largest or smallest amount sold were sometimes stated. A common error was to compare sales in only two years or quarters rather than generally. Some answers were just descriptions of the graph.

Question 20(d)

(d) Tom predicts that he will sell more than 60 computers in the 4th quarter of 2018.

What assumption has he made?

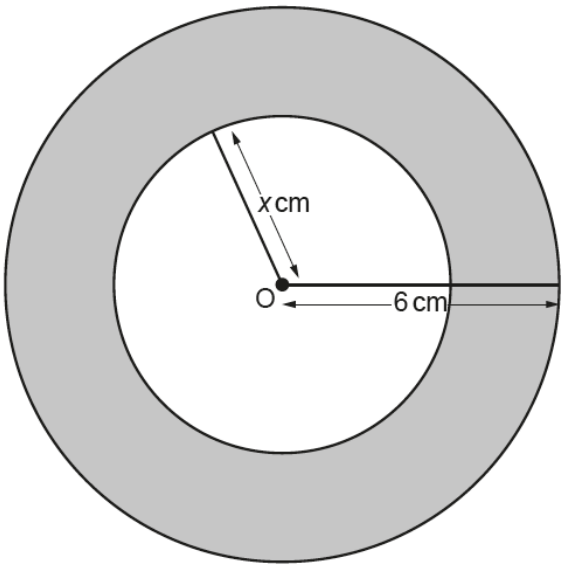
.....

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

Reward was given for recognising a 'continuing' upward trend in sales and some candidates conveyed this successfully. If the mark was lost it was because although an increase in sales was mentioned it was related to just previous years or a statement referred to just the highest figure in 2017. Some candidates suggested 'he will sell more' with no reference to the data.

Question 21

21 A circle, with centre O and radius 6 cm, contains another circle, with centre O and radius x cm.



Not to scale

Write down an expression, in terms of π and x, for the shaded area in cm^2.

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

Many candidates made no attempt at this question, and the correct answer was rarely seen. Some part marks were given for the inner area of πx^2 and, more commonly, the outer area of $\pi 6^2$ or $\pi 36$. A number of final expressions were in terms of r rather than x and the numerical value of 3 was commonly seen. Confusion with units also caused loss of marks.

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