

Examiners' Report
March 2013

GCSE Mathematics 5MB2F
Foundation (Non-Calculator)
Paper 1

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Introduction

There was no evidence to suggest that candidates had difficulty completing the paper in the given time.

The vast majority of candidates completed their answers in the spaces provided and many showed the steps in their working.

It was pleasing to see so many candidates showing the intermediate stages in their calculations.

A significant number of candidates did not use a ruler to draw the lines of symmetry in Q11 or the straight-line graph in Q18(b).

Candidates should be advised to justify their conclusions by making an explicit comparison of their findings.

Candidates should be reminded that, unless they are specifically asked to measure the length of a line or the size of angle in a diagram, they should expect the diagrams not to be accurately drawn.

Reports on individual questions

Question 1

This question was generally well answered.

In part (a), the vast majority of candidates were able to add the two numbers correctly. In part (b), the vast majority of candidates were able to subtract the two numbers correctly. Common incorrect answers were 133 and 277. In part (c), the vast majority of candidates were able to multiply the three numbers correctly. A common incorrect answer was 25 (usually from $2 \times 3 = 5$, $5 \times 5 = 25$).

Question 2

The most popular approach when answering this question was to find a quarter of 480 and subtract it from 480; relatively few candidates multiplied their quarter of 480 by 3. Many candidates, having divided 480 by 4, did not then go on to subtract their answer from 480. A common incorrect answer was 120.

Question 3

Few candidates were able to get full marks for this question. In part (a)(i), common incorrect answers were triangular pyramid, prism and trapezium. In part (a)(ii), a common incorrect answer was sphere.

In part (b), a significant number of candidates omitted to include the hidden edges (dotted lines) in their answer. A very common incorrect answer was 5.

Question 4

This question was answered well although some candidates omitted to include the correct monetary notation with their answer or wrote £700. A popular approach was to add ten lots of 50p to ten lots of 20p. Common incorrect answers were based on omitting to include all the coins in their calculations rather than on including too many coins.

Question 5

This question was answered quite well although a significant number of candidates were unable to interpret the scale on the temperature gauge correctly. Common incorrect readings for 118 on the temperature gauge were 114 and 110.8, and a popular incorrect final answer was 11. Some candidates thought incorrectly that the pointer had to go into the Danger Zone. Common incorrect answers were 24 and 23.

Question 6

This question was answered well. In part (a), most candidates were able to write down the correct coordinates for point *A*. Common incorrect answers were (3, 2) and (2*x*, 3*y*).

In part (b), most candidates were able to plot point *B* correctly. A significant number of candidates did not label their point with a '*B*'; some labelled their point with a '*B*' but did not mark it with a cross. Common incorrect answers were to mark the point at (−3, −3) or (3, −3).

Question 7

In part (a), many candidates were unable to write the decimal number as a fraction. A common incorrect answer was $\frac{1}{41}$.

Part (b) was done quite well. Many candidates were able to find the required percentage. A popular approach was to find 10% of 80 first. Common incorrect answers were 40 (usually from $80 \div 2$) and 60 (usually from $80 - 20$).

Question 8

Parts (a) and (b) were done well. Most candidates were able to read the required values correctly from the conversion graph.

Part (c) was done quite well although many were unable to explain their conclusions with sufficient detail. A popular approach was to use the graph to change 90 kph to 56 mph, multiply 56 by 3 to get the total distance travelled (168 miles) and compare this to the total distance needed (180 miles). Some candidates, having found both 168 miles and 180 miles correctly, simply stated their conclusion as 'no' without explaining the reason for that conclusion.



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Candidates should be advised to justify their conclusions by making an explicit comparison of their findings.

Question 9

This question was done well. Incorrect answers were rare in part (a); a common incorrect answer was 50 (ie with brackets inserted around $2 + 8$). A common incorrect answer in part (b) was 16 (presumably from $13 - 6 = 8$, $8 \times 2 = 16$).

Question 10

In part (a), many candidates were unable to identify the two similar shapes on the grid. Popular incorrect answers were **A, B** and **B, E**.

Part (b) was not done well. Few candidates were able to give both the correct perimeter of shape **C** (6) and the correct units (cm) for their answer and many simply omitted to include the units altogether. A significant number of candidates gave the area of shape **C** (2) rather than the perimeter.

Question 11

This question was answered well. Most candidates were able to draw both lines of symmetry. A common incorrect answer was to draw the lines of symmetry with two (sometimes one) diagonals. A small number of candidates thought that they were being asked to identify parallel lines rather than lines of symmetry.



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Candidates should be advised to use a ruler to draw lines of symmetry.

Question 12

This question was done well. Most candidates were able to use the correct algebraic notation in their answers. The use of the multiplication in the answer to part (a), eg $5 \times y$, was relatively rare. A common incorrect answer in part (a) was y^5 . A common incorrect answer in part (b) was $7k$.

Question 13

Many candidates were able to reach an answer of five coaches in this question, but relatively few were able to achieve this by fully correct means. A common approach was to find the total number of candidates (215) and then subtract lots of 47 or 50 for the total number of coaches. Less common was to subtract lots of 47 or 50 from the students in each year (eg $112 - 47 - 47$) and put any remaining students on a different coach. Calculation errors were common and many candidates were unable to deal fully with the adult helpers required on each coach, typically dealing with the adult helpers needed for only one coach, or four coaches, rather than for all five coaches.

Question 14

Most candidates were able to score some marks for calculating the correct angles, but few were able to give fully correct reasons for their calculations. A common incorrect reason for $360 - 300$ was 'angles in a **circle** sum to 360'. A significant number of candidates thought the triangle was equilateral or isosceles.

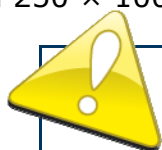


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Candidates should be reminded that, unless they are specifically asked to measure the length of a line or the size of angle, they should expect diagrams to be not accurately drawn. Many candidates referred to the angles in the diagram as simply $X (= 60)$ or $Y (= 35)$. Candidates should be encouraged to write angles unambiguously using a three-letter notation when appropriate, eg angle $ZXY = 60^\circ$.

Question 15

Most candidates were able to score marks for using two full glasses, or attempting to find the total volume of drink for all people or changing to consistent units, but relatively few attempted to deal with the ratio. A common incorrect answer was £50. Many candidates were unable to do the calculations involving multiples of 10, eg 50×500 and 250×100 were often incorrectly calculated as 2500.



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Candidates should be advised to state the reasons for their decisions, eg explain why 2500 ml has been rounded up to three bottles of orange squash.

Question 16

This question was not answered well. Few candidates were able to score all three marks.

In part (a), a common incorrect answer was square and parallelogram. In part (c), a common incorrect answer was trapezium.

Question 17

Few candidates were able to score full marks in this question. A popular approach was to work out the number of tiles needed horizontally and vertically. A significant number of those candidates who obtained 15 and 10 using this approach then went on to add these numbers to give the incorrect answer of 25. Another popular approach was to find the area of the wall and then attempt to divide this by the area of the tile. Most of the candidates using this approach multiplied the 2 by the 3 and then attempted to convert 6 m^2 to cm^2 , often with little success. A common incorrect conversion here was $6 \text{ m}^2 = 600 \text{ cm}^2$. Those candidates who elected to convert the 3 m and 2 m to cm first were often unable to multiply 300 and 200 correctly. A common incorrect calculation here was $300 \times 200 = 6000$. A significant number of those candidates who were able to calculate the area of the wall in cm^2 correctly did not then go on to divide this by the area of the tile (400 cm^2). Common incorrect answers here were $60\,000 \div 20$, $6000 \div 20$ and $6000 \div 40$.

Question 18

This question was done quite well. Many candidates were able to complete the table and draw the line. A common incorrect answer in part (a) was $y = -1$ (at $x = -1$). In part (b), a significant number of candidates were able to plot the points correctly but did not connect with a straight line. Some candidates, having made an error in the table, then went on to plot the correct line in part (b), thus ignoring the error in the table. Many candidates did not use a ruler to draw the straight line.



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Candidates should be advised to draw lines over the entire interval defined by the values of x in the table.

Question 19

Many candidates did not know how to start this question. A very common incorrect answer here was $\frac{4}{10}$. A significant number of candidates, having reached the correct fractions with a common denominator, eg $\frac{3}{8} + \frac{4}{8}$, then incorrectly went on to add the numerators and the denominators.

Question 20

In part (a), many candidates did not know what was meant by 'factorise'. A popular incorrect answer was $15t$. Some candidates did not appreciate that both the $3t$ and the 12 needed to be divided by 3. Common incorrect answer here was $3(t + 12)$ and $3(t + 9)$.

In part (b), many candidates did not appreciate that to expand a bracket they needed to multiply both terms in the bracket by the number outside. Common incorrect expansions were $14x + 1$ and $6x + 3$. Some candidates attempted incorrectly to 'simplify' inside each brackets before expanding them, ie $7(2x + 1)$ became $7 \times 3x$ and $6(x + 3)$ became $6 \times 3x$. A significant number of candidates, having reached the correct expansion $14x + 7 + 6x + 18$, did not then go on to simplify this correctly. Common incorrect answers were $14x + 15$ and $45x$ (by 'simplifying' $20x + 25$).

Summary

Based on their performance on this paper, candidates should:

- be advised to justify their conclusions by making explicit comparisons of their findings
- be reminded that they should not take measurements from diagrams unless specifically asked to do so
- be advised that, when drawing straight lines from values in a table, they should use the entire range of values of x given in the table
- be encouraged to use a ruler when drawing lines of symmetry in diagrams
- be advised to give the units with their answers.

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