Examiners' Report
Principal Examiner Feedback

Summer 2025

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Foundation (Non-Calculator) Paper 1F

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Summer 2025
Publications Code 1MA1_1F_2506_ER

GCSE (9 – 1) Mathematics – 1MA1

Principal Examiner Feedback – Foundation Paper 1

Introduction

This paper provided good coverage across the specification and allowed students the opportunity to demonstrate their ability across the grades. Plenty of success was seen across the early part of the paper as students showed confidence picking up marks in the first half of the paper.

Challenges arose when questions contained a context and with it the need to extract the key pieces of information and identify correct mathematical processes – this is an area for improvement. Learners also found questions with multiple stages in their working challenging. Questions requiring an element of evaluation or conclusion is also an area to develop as learners worked through the mathematical elements successfully but failed to conclude correctly in the context of the question. Good amounts of working out were seen which certainly helped students, especially those who had arithmetic errors as part of their solution.

Questions where learners were required to show their working or give reasons saw most attempting to justify their answer. For those questions requiring a written conclusion, most responses did have some sort of decision showing that students are well-accustomed to this sort of demand in a question.

Areas of the specification that need to be improved upon are highlighted in the list at the end of this report.

Comments on individual questions

Question 1

Learners were generally able to simplify the algebraic expression by collecting like terms. Common errors were giving the answer e^5 or 5^e which came from misconceptions around the meaning of indices.

Question 2

Knowledge of basic fraction and decimal equivalents was a topic that learners were confident on with many correctly recalling that $\frac{3}{4}$ is equivalent to 0.75. Where incorrect answers were seen these included 0.25, 0.3, 0.34, 3.4, 34, 7.5 and 75.

Question 3

Learners were often able to convert from millimetres into centimetres with many giving the correct answer of 6 centimetres. Common incorrect answers generally involved applying an incorrect conversion factor leading to answers of 600, 0.6, 0.06, 0.006 or 0.0006.

Question 4

Learners were generally able to identify the multiple of 8 that is between 25 and 35. Where the correct answer was not given common incorrect answers were 24 or involved giving the correct multiple of 8 together with a multiple of 8 that was outside the required range.

Question 5

Learners were generally able to identify that a 53° angle is an acute angle. Spelling errors were commonly seen, but were condoned if the intention was clear. The most common incorrect answer was to identify the angle as obtuse with a significant minority stating right angle.

Question 6

In part (a) of this question, learners needed to calculate the total number of blue pens and red pens that Samina sold in June, this involved identifying the appropriate values from the table and adding them. This was generally answered well and most responses saw the correct values identified and accurately added. Where errors were seen these were usually either an error in addition (often leading to an answer of 32) or selecting the wrong values to add.

Part (b) required learners to show whether or not Samina was correct. They needed to find the number of blue pens sold and the number of red pens sold and then show whether there were more than twice as many blue pens as red pens sold. Learners were generally able to make a start to the process by finding the number of blue pens or the number of red pens, they often followed this by either doubling the number of blue pens sold or halving the number of red pens sold to find comparable values. A minority of learners chose to work out number of blue pens ÷ number of red pens to answer the question.

The most common error was to merely find the number of blue pens sold and the number of red pens sold without an attempt to find comparable values. Even when the correct decision was then made, this was not sufficient in this case as this question required the learner to show their working. The were several other learners who did show all the necessary working and reached the correct figures but did not then make the correct decision. It was also common to see correct processes which were not accurately completed due to arithmetic errors. Others found the difference between blue pens and red pens each month.

Question 7

Learners were generally able to correctly complete the bar chart in part (a). There were instances of unruled bars or bars which were slightly misaligned with the axis, but these were condoned as long as the intention was clear. Where fully correct responses were not seen many learners were able to gain 1 mark which was generally for one of the two bars being plotted correctly, most often for drawing the bar at height 8 as drawing the bar of height 3 proved slightly more challenging.

In part (b) learners needed to show that the total amount of money in the bag was less than £10. Many learners were able to work correctly with the numbers of each type of coin and produce an accurate total of £9.60 which demonstrated the required result. There were some learners who had a fully correct method, but made errors in the evaluation or who had inaccurate money notation most commonly stating £9.60p as their final answer. A common error was to use the wrong frequency for one or more of the coins, however these learners were often able to gain 1 mark for a method to find the total amount of at least two coin types. It was not common to see learners mixing pounds and pence in their method, but where this was observed it was condoned for the method marks. Some learners did not recognise the need to work with the frequency of each coin and instead just added the four coin values. In a small number of cases learners confused money with time and worked incorrectly with 60p in a pound.

Question 8

In part (a) of the question learners were asked to complete the kite based on the two sides given. Successful learners recognised the line of symmetry for the shape and completed the kite accurately. Some learners did not use a ruler, this was condoned as long as the intention to draw straight lines was clear. Common errors included the missing vertex being placed one square too high or to the right. In some cases it appeared that learners had not realised that they could use the grid squares in order to work out the accurate position of the missing vertex and the position was inaccurate, it appeared that this might sometimes have been due to working inaccurately with tracing paper. Some learners drew irregular quadrilaterals which were not close to the required kite and others drew triangles.

Identifying the mathematical name of the solid shape drawn was answered well with many learners able to correctly recognise that this was a cylinder. Poor spelling was relatively common, but this was condoned as long as the intention was clear. Circular prism was also acceptable as an answer, but this was seen far less frequently. Some learners merely stated circle or prism which were not acceptable. Common incorrect answers included sphere or cuboid.

Question 9

In part (a), learners were told that Greg was x years old and that he was 5 years older than Katy. They were then asked to write down an expression, in terms of x, for Katy's age. Correct responses of $x - 5$ were awarded 1 mark, sometimes an equation such as $k = x - 5$ was given which was condoned. Common incorrect answers included $x + 5$, $5x$ and expressions which were not given in terms of x. An understanding of the term 'expression' was not always present. Some gave a numerical value given for what they thought was the age.

In part (b), learners were told that Carl is twice as old as Greg, and were asked to write down an expression in terms of x for Carl's age. Learners were often able to correctly give $2x$ or $x \times 2$. Common incorrect answers were x^2 or, in common with (a), responses which were not in terms of x.Solving $4y = 12$ was answered successfully by many learners. Where incorrect responses were seen these commonly included 48 (multiplying 12 by 4 rather than dividing) or 8 (from 12 subtract 4).

Question 10

Learners were generally confident at rounding to the nearest 1000 and were able to identify that 23619 to the nearest 1000 is 24000. Incorrect answers, when seen, included 23620 (rounding to the nearest 10), 23600 (rounding to the nearest 100), 23000 (truncating to 1000s) or 20000 (rounding to the nearest 10000).

Working out an estimate to the calculation 5.9×98.1 was often answered successfully. Learners chose from a range of the acceptable calculations given in the mark scheme, with 6×100 and 5.9×100 being very commonly seen and almost universally correctly evaluated. The estimation of 6×98 was also commonly seen but there were more errors in evaluation in this case. Some learners began by working with one of the acceptable estimated calculations but then subtracted additional products after the rounded calculation in an attempt to reach a more accurate value, this was accepted for 1 mark unless one of the acceptable estimations was reached as their final answer. Use of 5 as an estimate for 5.9 was not accepted, but this was often seen in a calculation that gained credit for use of 100 or 98. The most common incorrect answer was to attempt to work the given calculation out accurately, this was sometimes followed by rounding the answer obtained.

Question 11

In part (a) learners were asked to work out $\frac{5}{8} - \frac{1}{4}$. Many learners recognised the need to write the fractions over a common denominator and were then successful in completing the required calculation. The most efficient approach was to use a common denominator of 8, but learners did not always recognise this and so denominators of 16 and 32 were also utilised. Some learners identified that they need to write the two fractions over a common denominator, but made an error when finding the numerator and this gained 1 mark when seen. Some learners worked correctly, but then attempted to simplify their answer and made errors at that stage, in these cases the subsequent working was ignored as learners had not been asked to give their answer in its simplest form. An uncommon approach was to attempt to work with a common denominator of 4, this led to a decimal in the numerator of the first fraction and was only condoned if this was recovered later in working to give a fraction where both the numerator and denominator were integers.

A common incorrect approach was to merely subtract numerators and denominators leading to an answer of $\frac{4}{4}$. Other incorrect methods involved changing the subtraction to an addition which was often seen alongside inversion of the second fraction suggesting that learners had confused their method for subtracting fractions with a method for division of fractions.

In the second part of the question learners were asked to find $\frac{2}{5}$ of 40. The most successful responses broke this down into two stages, firstly calculating $40 \div 5$ and then multiplying by 2, this was generally successfully completed although some errors were seen in evaluation. However, as long as the learner showed the correct processes e.g. 40 ÷ 5 = 8, 8 × 2 = 14, one mark was gained even when arithmetic errors occurred. Some learners worked correctly initially but gave their answer as $\frac{16}{40}$.

Where errors were seen these included incorrect attempts to convert $\frac{2}{5}$ to a decimal or percentage, multiplying by 5 instead of dividing by 5, with many instances of learners equating 2/5 as a half. A few learners worked with percentages, recognising 2/5 as 40% which was acceptable, however when errors were made these learners often did not show their method for finding the incorrect values stated. Final answers of 8 and 20 were common; and a significant number of learners who found $\frac{1}{5}$ of 40 rather than $\frac{2}{5}$ of 40. A small but significant minority found the correct answer but then subtracted this from 40.

Question 12

This question differentiated well between learners. In part (a) learners were asked to identify the train which takes the least time to go from Liverpool to Crewe, showing how they reached their answer. Identifying the required times and showing the appropriate subtractions was commonly seen, however learners often treated the times as values with hundreds, tens and units leading to errors in the evaluation of the second calculation. Counting on was also a common approach and this was successful in many cases with learners often able to work correctly to find the three required journey durations and give a correct conclusion. Learners who worked by showing 'jumps' from the start time to the end time often made errors in their 'jumps' and did not show working to find these.

Some learners did not show their method, where correct journey durations were seen this was not an issue as the method is implied, however others reached incorrect journey durations which limited the marks which could be awarded. Other common errors included finding the journey duration(s) for a different journey, often Liverpool to Birmingham, or reading the wrong times from the timetable.

Quite a few learners thought that the first train was fastest as it arrived at an earlier time than the other trains - working with which train would get you there earliest rather than the fastest train.

Part (b) of the question required working with the concept of a delayed train and asked how long Rose would need to wait for the train. This proved to be more challenging for learners. Learners who were successful generally worked out that the delayed train would arrive at 10:05 and then found that this was 40 minutes after Rose arrived at the station. Whilst many were able to recognise that Rose would catch the 09:30 train it was common for learners to struggle to know what to do with this and this led to incorrect answers of 10:05 (the time of arrival of the delayed train). Another common error was to arrive at an answer of 10:00 which came from waiting 35 minutes from her arrival at the station and did not make reference to the train timetable. There were also a significant number of responses that worked with a whole variety of different numbers, which were often not from a clear source, and added 35 minutes.

Question 13

This was a fairly standard question on working with number machines. In part (a) learners were asked to find the output given an input of 6, this was generally well answered with many learners reaching the correct answer of 10. Where incorrect answers were seen these were often from errors in arithmetic.

In part (b) learners were asked to find the input when the output was -11. In many cases learners were able to identify that they should use inverse operations to reverse the stages of the number machine and correctly found that $-11 + 8 = -3$ and $-3 \div 3 = -1$ giving a correct answer of -1. It was common to see learners who could identify the inverse operations needed (+8 and ÷3) but made errors in evaluation, often in working with negative numbers, this led to a common incorrect answer of 1. Others started a method using inverse operations, $-11 + 8$, but multiplied by 3 rather than dividing. Another common error was to use the -11 as the input rather than the output.

Question 14

This question required learners to work with unit conversions and a map scale in order to find the length of a road on a map. There were two aspects that needed to be addressed in responding to this question – unit conversion between kilometres and centimetres (which could be done in stages or by converting everything to metres) and applying the scale of 1:20000.

Few learners were able to correctly find that the length of the road on the map would be 8cm and there were a variety of errors seen. Where fully correct answers were seen these generally involved converting 1.6 km to 160 000 cm with 1600 m often seen as an intermediate step, followed by division by 20000 or by comparing the ratio 1 : 20000 to a ratio of x : 160000 and working with equivalent ratios. Some learners made a start to a conversion, often by identifying that 1.6 km is 1600 m, and then were able to identify that they should divide by 20000 which scored 2 marks. It was also common to award 1 mark for conversion of 1.6km to 1600m which was followed by no further correct working.

Where conversions were attempted, there were often errors seen in these, often due to linking these to the incorrect unit, for example 1600 cm, or using an incorrect conversion factor which was generally the wrong power of 10 (10, 100, 1000 being used for the wrong conversion). Incorrect conversions were only occasionally followed by a correct attempt to apply the scale factor for the map, however where this was seen this was awarded 1 mark for [distance] ÷ 20000. Common incorrect answers involved processes with incorrect attempts at conversion, multiplication of 1.6 by 20000, or division of 20000 by 1.6. In other cases learners used a variety of different arithmetic operations with the numbers in the question and attempted conversion factors. It was notable that many of the incorrect answers seen were not reasonable for a length of a road on a map.

Question 15

This was a standard question on multiplication of a 3 digit number by a 2 digit number. A majority of learners were able to work accurately with their chosen method to obtain the correct answer. The most common approaches to multiplication were the column method and Napier's bones. Where an accurate final answer was not obtained then this was often due to slips in arithmetic, but there were also a significant proportion of learners who made errors in place value when attempting the multiplication. The most common of these place value errors was when multiplying the 135 by the 4 in 48 and forgetting to 'add a zero' in the 'units' column. Several learners also forgot to put the decimal place into their answer. An unusual approach that was seen from some learners was to recognise that 0.35 could also be interpreted as 35% and then work to find 35% of 48 which was commonly done by combining 3 lots of 10% with 5%, this was then added on to 48 to complete the method. The Napier's bones method was used by some learners however some got confused with the direction of the partitions in the grid.

Question 16

This question gave learners information about two triangles where one was nested inside the other. They were asked to show that two of the lines were parallel.

Fully correct answers were sometimes seen, but it was more common to award part marks. The learners that were most successful in this question clearly labelled their angles and stated their angle facts clearly. They then used either arrows or clearly indicated which angles they were working with using three letter notation. The most common approach to demonstrating that the two lines were parallel was to find that angle ECD was 70° stating that angles in a triangle added to 180° and/or that base angles of an isosceles triangle are equal, followed by identifying that angle ECD and angle ABC are equal and referring to corresponding angles being equal. However correct solutions were also seen using the angle sum of co-interior angles.

A different, but not uncommon, approach to answering this question was to attempt to explain that the triangles were similar. A number of responses tried to explain this using various terminology, but learners were often not exact in their geometrical reasons which meant that full marks were rarely awarded.

Learners struggled with labelling angles, learners who attempted to label the angles often did so with ambiguous single letters or double letters rather than the conventional three letters.

Learners who did not give a fully correct answer were often able to gain partial credit for correctly finding angle ECD or correctly finding angles ADB and DAB which were generally marked on the diagram. In some cases, learners worked out values for angles, but did not indicate which angle they were finding which was not awarded the mark. It was also common for learners to gain a mark for giving a correct relevant reason relating to finding an angle in a triangle. There were some responses where irrelevant or incorrect angle reasons were given, irrelevant reasons were ignored provided a correct reason was seen but incorrect reasons were not condoned.

As would be expected, learners found identifying the angles that were needed to demonstrate that the two lines were parallel more challenging than finding the missing angles in the triangle. For the third mark they needed to either indicate that appropriate pairs of angles were equal or give appropriate angle pairs summing to 180°. The final mark required that the appropriate angles had been identified and the correct reason relating to angles in parallel lines was given.

In a minority of cases learners started by assuming that the lines were parallel, although this was not stated. They then used properties of angles in parallel lines in order to find missing angles in the diagram. Learners were often able to gain 1 or 2 marks starting from this assumption, but did not then have appropriate explanations as to how this tied in with the rest of the information in the question to show the required result.

Question 17

In this question learners were presented with a list of ingredients for 10 pancakes and the amount of each ingredient available to Sam. They were asked whether there was enough of each ingredient to make 15 pancakes.

The most common successful approach was to find the amount of each ingredient needed to make 15 pancakes and compare this to the amount available followed by a conclusion that there was not enough milk. Some learners showed the correct process with errors in evaluation, or found the correct figures for 15 pancakes but gave an incorrect conclusion, and so gained 2 of the available marks. Where partial working was seen, generally where only some of the ingredients were considered, it was generally possible to award 1 mark for a correct process to find the amount needed of 1 ingredient. A common error when working with finding the amount of ingredients needed was unsuccessfully working with decimals when calculating how many eggs were needed.

A less common approach was the process to find the quantities of pancakes that can be made with each ingredient. Where this was seen it was common to award 2 marks as there were often errors in the evaluation of the calculations. It was common, however, to award 1 mark for finding that it was possible to make 20 pancakes with the amount of flour available. In some instances, learners obtained close, but not correct values, without showing their working.

Some learners chose to work out how much of each ingredient would be left after 10 pancakes were made and to find the amount needed to make 5 pancakes. Where all of the correct figures were found and the correct conclusion given then full marks were awarded. Where an incorrect conclusion was given or some of the values were incorrect then 2 marks was given.

In other cases, learners attempted a hybrid of the different possible approaches. Provided that the calculations allowed for each ingredient to be considered and the values were accurate for each ingredient then this was awarded 3 marks if the correct conclusion (not enough milk) was seen. If values were inaccurate or there was not the correct final conclusion then 2 marks for the method were awarded.

A relatively common error was for learners not to consider each of the ingredients in turn or not to show all of their working. Learners should ensure that they read the question carefully and include all working when this is required.

Question 18

Learners were often successful at completing the stem and leaf diagram and giving an appropriate key. Common reasons for partial credit being awarded were the stem and leaf diagram being unordered or errors/omissions in the stem and leaf diagram. Some learners used a stem of 130, 140, 150 which was accepted. Completion of the key was also done well with many learners able to give an appropriate example to show how the key worked. Some learners only gave a partial key where they showed e.g. 13|5 but did not indicate what this represented.

A common incorrect answer was to use a stem of 1 which was not suitable as all of the values should then be in a single row, but could still gain credit for a correct key provided it was consistent with their stem and leaf diagram. Some learners were not aware of what was required for a stem and leaf diagram and drew tally charts or pictograms.

Question 19

In this question learners were asked to find the highest common factor (HCF) of 54 and 120. Many learners were confident in doing this and were able to find the correct answer of 6 following from either a consideration of the factors of each number or from correct factor trees. Where errors were seen these were often slips in the factor trees or inclusion of incorrect factors in the attempted lists, however it was often still possible for learners to gain 1 mark. It was also common to award 1 mark for an answer of 2 or 3 which were common factors, but not the highest common factor. The most common answers which did not gain credit followed from attempts to find lowest common multiple of the two numbers, although some of these attempts did gain 1 mark where a factor tree was completed.

Question 20

In part (a) of this question learners needed to work with the sum of all probabilities for the exhaustive outcomes being 1, together with information about there being twice as many blue counters as green counters in the bag, in order to find the probability of taking a blue counter. This was very well answered with many learners able to find that the probability of blue was 0.4. In some instances, a correct probability of 0.4 was seen followed by this being incorrectly identified as the probability of green or further working with the 0.4 such as $\frac{0.4}{0.6}$ or $\frac{0.4}{1}$ possibly because they thought the probability had to be a fraction, in these cases learners were awarded P1P1A0. Some learners were able to find that P(blue) + P (green) = 0.6, which was often seen as $1 - 0.4$ in the working space or where their two probabilities added to 0.6, and this was awarded P1. Incorrect approaches involved a variety of different arithmetic processes being applied to the values given in the question and included some instances of probabilities greater than 1 being given for blue or green or both. There were also instances of this question not being attempted by learners which may have been an indication that they did not know how to start.

Part (b) proved more challenging for learners than part (a). In this part of the question learners were told that there were 45 red counters in the bag and were asked to find the total number of counters in the bag. The most efficient method to do this was to work out $45 \div 0.3$, however this was not a common approach. Most learners worked with the ratio of the probabilities in the table from (a). If the learner had an incorrect probability of blue and probability of green in the table in (a) then they were still able to reach the correct answer of 150 as long as their probabilities added to 1. In some instances, learners had probabilities that added to a total other than 1 in part (a) and could gain the method mark for working with their ratio of probabilities, but could not gain the final mark as the correct answer of 150 could be obtained from the information provided in the question.

Question 21

In this question learners were working with a quadratic equation in what was a fairly standard question. In part (a) they were asked to complete the table of values for the given equation, in part (b) to draw the graph and in part (c) to write down the coordinates of the turning point of the graph.

Some learners were confident in the method required to find the missing values for the table – substituting the given x values in order to find the corresponding y values. Common errors when attempting substitution were errors in dealing with working with the negative number (-2), particularly when squaring, or in working with the 0. Some learners did not attempt substitution. Others tried to complete the missing values by looking for a pattern in the table which would have been successful in a table of values for a linear equation with equally spaced *x* coordinates, but did not work in the case of the quadratic equation in this question.

In part (b) learners generally demonstrated understanding of how the table of values related to drawing the graph required, as was evidence by plotting of their points. Provided 1 mark was awarded in (a) then a follow through was awarded in (b) for correctly plotting their points. Where learners did not have a correct table of values in (a) this often led to a curve which did not have the expected parabolic shape, however it appeared that many learners were not aware of the shape of the quadratic curve and so did not identify this as an issue.

After plotting their points, most went on to join their points with a smooth curve which gained both marks if the correct points had been plotted. Curves with a flat bottom (between $(-1, -4)$ and $(0, -4)$) were a common error. Some learners who plotted correct points were inaccurate when joining this with a curve, missing some of their points entirely. Only a small proportion of those who attempted to join the points with a curve utilised line segments.

In a very small number of cases learners who did not complete the table of values in (a) plotted a correct curve in (b) which was awarded the marks.

Part (c) of the question asked for the coordinates of the turning point of the curve. Learners who had a curve in (b) were often able to identify the coordinates of their single turning point and gain the mark here. Common errors were inaccuracy in reading the coordinates or for omitting a negative sign (commonly on the *x*-coordinate). In some instances it was not possible to award the mark here as there was not a single turning point in (b) due to the shape of the graph shown. Some learners attempted this part of the question but did not have a graph with a single turning point plotted in (b) so would only have been able to gain credit for the correct turning point of the quadratic graph which could be obtained by calculation, however this was not seen.

Question 22

The first part of this question required learners to work with fractions of amounts, dividing in a ratio then writing a ratio and simplifying. Most learners were able to make a start to the process by finding $\frac{1}{7}$ of 280. It was also common to see the correct processes to divide the remaining 240 chocolates in the ratio 1 : 3 which was required for the next two marks. Writing the ratio of white chocolates to dark chocolates and simplifying accurately proved more challenging for learners. As with other questions, errors in arithmetic were seen which meant that the final accuracy mark was lost, however the process marks could be gained.

Common errors in the process were to divide 280 in the ratio 1 : 3 having neglected the $\frac{1}{7}$ of the chocolates that were dark chocolates. Others assumed that the ratios 1 : 3 and n : 1 meant that there were equal numbers of milk and dark chocolates.

A less common approach, but one which was generally successful when seen was working with the fraction of each amount, identifying that there were $\frac{1}{7}$, $\frac{1.5}{7}$ and $\frac{4.5}{7}$ for dark chocolates, milk chocolates and white chocolates before then selecting 4.5 as their correct answer.

In part (b) learners were told that 10 milk chocolates were eaten and asked whether this affected their answer to part (a). This proved to be a challenging question for learners with many stating that it did impact their answer. Where correct responses were seen these generally identified that changing the number of milk chocolates did not impact the number of dark chocolates or white chocolates.

Question 23

This question asked learners to work out $5.7 \times 10^2 + 9.8 \times 10^3$ giving their answer in standard form. There were some learners who were confident at interpreting standard form and were able to complete the question correctly, often by writing the two numbers as 570 and 9800 before adding these together and converting back into standard form. Some learners were able to write the two numbers as ordinary numbers and add these to obtain 10370 but did not convert back into standard form for the final answer. It was rare to see learners attempting to work by matching the powers of 10 for the two terms being added e.g. as $0.57 \times 10^3 + 9.8 \times 10^3$.

Common errors included misconceptions around the standard form notation which led to the numbers being interpreted as 5700 and 98000 which was not awarded credit. There were also those who attempted to combine 5.7 and 9.8 without noting, or ignoring, the difference in the powers of 10 and then made incorrect attempts to combine the powers of 10 also (as 10^5 or 20 with or without a power), this led to answers such as 15.5×10^5.

Question 24

In this question learners were given a partially completed regular polygon and given information about an equilateral triangle and square that could be formed within this polygon. They were asked to find the number of sides of the polygon. This question had a significant proportion of blank responses or minimal attempts seen.

Many learners were able to identify that the interior angles of the equilateral triangle are 60° and that the interior angles of the square are 90°, however this did not gain any marks until they added these to find the interior angle of the regular polygon (150°) which many did. Learners often struggled to progress further with the question. Some went on to find the exterior angle but often did not know that they should divide the sum of the exterior angles by 30 to find the number of sides.

Where fully correct answers were seen these were split between those who found the exterior angle of the polygon and then worked out $360 \div 30$ and those who found 150 and then used trial of the interior angle sum to identify that 1800 was a multiple of both 180 and of 150 which allowed them to identify that the shape had 12 sides. In some cases learners guessed the correct answer of 12, but without supportive working this scored 0 marks.

Question 25

In this question learners were asked to find the equation of the line shown. There were few fully correct responses to this question and a significant minority of learners did not attempt it. Where learners did attempt to answer the question it was unusual to see a fully correct equation for the line L. A greater number of responses correctly identified the y-intercept as 3 or used the correct structure for the equation of a line, $y = mx + c$ which were awarded 1 mark. It was uncommon to see a method to find the gradient.

Some learners gave an answer of $y = \frac{3}{4}x + 3$ which was only incorrect due to not dealing with the negative gradient and gained 2 marks. Common incorrect answers included giving coordinates, often (4, 3) which was obtained from the intercepts with the axes or stating $x = 4$ and $y = 3$ together, either in the working space or on the answer line, which did not gain credit. Where equations of lines were attempted, these often included the values 3 or 4, combined with the variables x and y, for example $y = 3x + 4$ or $3x + 4y$.

Question 26

This question involved addition of scalar multiples of column vectors. Many learners were able to interpret the demand of the question correctly and find the required result. In some instances errors in evaluation of a correct method meant that only one mark was awarded. Common incorrect approaches included combining the values within the vectors or obtaining a single value for the answer. It appeared that some learners were not familiar with vector notation and interpreted the information given as fractions. Lots of learners scored a mark for a correct value in the final vector – this was most often the 20 as many learners struggled to work with the negative number. Some learners tried to "simplify" their vector as if it was a fraction.

Summary

Based on the performance on this paper, learners / centres should work on:

- improving numeracy skills, including multiplication and division skills when working with integers and decimals,
- arithmetic involving negative numbers,
- arithmetic with fractions including when to find a common denominator and how to find a fraction of an amount,
- working with time in contextual questions,
- unit conversions for length and working with scales given as a ratio,
- the interpretation of problems involving ratio,
- working with inverse number machines,
- completing tables of values for, and drawing, quadratic graphs,
- giving complete geometrical reasons when working with triangles and with parallel lines,
- using angle notation such as BAC to describe angles in a diagram,
- working with the sum of interior angles and the sum of exterior angles of polygons in problem solving,
- finding the equation of a given line,
- encouraging students to set out their working using logical steps,
- encouraging students to read the question carefully so that they understand what they are required to do and what format the answer should be stated in,
- interpretation of questions involving context and multistep processes.

Pearson Education Limited. Registered company number 872828 with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom