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General Certificate Secondary of Education
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Applications of Mathematics (Pilot) 93702F

(Specification 9370)

Unit A2: Applications of Mathematics (Geometry and Measure) - Foundation

Report on the Examination

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Unit 2: Foundation Tier

General

The paper appeared to be accessible to its target group with most students appropriately entered for the tier. The paper differentiated well giving less able students an opportunity to tackle easier problem solving questions with some degree of success. There were an appropriate number of more demanding questions that challenged more able students. In particular, questions 10(b), 11(c), 12(c) and 14(c) proved challenging to many. Most attempted to show their working which is necessary to maximise scoring chances, particularly in longer multi-step questions. It was evident that some students were not properly equipped for this examination with many clearly not having a pair of compasses and, from the large number of arithmetical errors seen, a calculator.

Topics that were done well included:

- symmetry of shapes
- simple worksheet problem
- reading scales
- identifying coordinates
- reading from graphs.

Topics which students found challenging included:

- multi-step problem involving conversion graph
- multi-step problems involving area and perimeter
- questions involving change of units
- questions requiring explanations
- analysis of speed-time graph

Question 1

Part (a) was answered well and part (b) was answered very well. Considerably less success was gained in part (c).

Question 2

Part (a) was well done although some students miscounted the hours with, for example, the number of hours from 6 am to 10 am sometimes being 5 instead of 4.

Part (b) was also well done with some benefiting from follow through from miscounted hours in part (a). Most scored at least two marks for part (b) but some failed to convert their total to the nearest ten pounds.

Question 3

Nearly all students gained full marks in part (a). A minority gave the speed of the car as 45 mph but most of these scored both marks in part (a)(ii) on follow through.

Many gained both marks in part (b) with, overall, students doing better in part (b)(ii).

Many found part (c) difficult. The main problem for many students was that they answered a question about the cost of a single apple, rather than a single kilogram of apples, with £1.30 being a common incorrect answer.

Question 4

Overall, students found parts (a) and (b) straightforward. The main error in part (b) was to multiply 100 by 8, instead of 2, when finding the total amount of honey required. Some students managed to work out that 200 grams of honey were required but forgot to subtract 150.

Many students struggled with part (c). The most successful method involved realising that multiplication by 9 was required. Some did not manage to proceed from there and, of those that did, some stopped at 18 litres without working out the number of bottles required. The alternative method of starting by working out that 1 person required 0.5 litres was used successfully by a few students.

Question 5

Most students did this question quite well. Some dropped marks by failing to meet all the criteria, most notably by choosing a set of coins for Pete from which £1.20 could already be made. Some failed to interpret what was required in this question.

Question 6

Part (a) was done reasonably well with the most common error being to give North instead of South and West instead of East.

In part (b) very few identified the required angle and measured it accurately. Only a very small proportion of these wrote their result as a 3-figure bearing.

Virtually all students wrote the coordinates correctly in part (c).

Most students obtained the correct answer to part (d). A common error was to miscount the length from A to B. Some students showed no appreciation of the concept involved in this question.

Question 7

Parts (a), (b) and (c) were well done showing that most students could make relatively simple interpretations of graphs of this nature.

In part (d) many students stated that Ben saved more than Alice per month to score one mark but relatively few also stated that after 4 months Ben had saved more to obtain a fully correct solution. Some students attempted to calculate the time it would take Ben and Alice to save £200 with many working out one or both of these correctly.

Question 8

Many students did not know what either a factor or a multiple was or confused the two. Few scored full marks by giving all the required multiples and factors accurately and going on to make the correct conclusion. Many students realised there were 10 multiples but far fewer could find all 9 factors.

Question 9

This question was only done well by the more able students. To score full marks students needed to obtain the QWC mark. This was awarded for showing all the steps needed without any conceptual errors. A typical conceptual error seen fairly often was the conversion of 5.3 feet [from $(8 \times 8) \div 12$] to 5 ft 3 inches instead of 5 ft 4 inches. Some scored four marks for a correct solution without showing their conversion between centimetres and inches required for the QWC mark. Many students scored one mark either for showing a conversion between centimetres and inches or for converting 5 ft 6 inches to 66 inches and doing nothing else.

Question 10

In part (a) many students knew that there were 360° in a circle but did not know the corresponding angle fact for a straight line.

Some students failed to appreciate what was required to make any progress in part (b). Many confused area and perimeter. Those who scored marks often failed to work out the correct length of the side of one of the squares with $420 \div 8$ being common instead of $420 \div 6$. Some students went on to work out the area of one or two squares from these incorrect lengths and scored 1 or 2 marks on follow through.

Question 11

Part (a) was not well answered with many not obtaining comparable units. Some appreciated the need to do this but converted between millimetres and centimetres incorrectly. Errors made by less able students included adding the diameter to twice the length, adding half the diameter instead of the diameter and attempting to work out the area or circumference of the tube before adding it to the length. Many students decided that the rolled up poster did fit tube A but did not fit tube B but relatively few gave a valid reason. This was particularly the case in part (b)(ii).

Very few students scored high marks in part (c). Some managed to calculate one or two of the dimensions of the plan view of the box but often struggled with the next step of visualising the box as a three dimensional shape and working out its volume.

Question 12

Parts (a) and (b) were very well done.

Students found part (c) difficult with well over half unable to give a meaningful response. Many of those who attempted to use the distances travelled at 2.00 pm often did not carry their method through completely or correctly. For example, some gave just one of 24 or 16 or gave both of these values but made no attempt to subtract them. Others attempted to compare distances at 3.00 pm or made a statement based on the slopes of the graphs.

Question 13

Some good answers were seen in part (a) but many could not cope with the scale and/or the locus. Some were handicapped by the lack of a pair of compasses. Some students scored one mark for drawing the wrong sized arc and others for marking three or more points the correct distance from X. A common incorrect response was a square inside the field with one corner at X.

Less able students also struggled with part (b) but it was answered better than part (a) with most students attempting this without using a pair of compasses.

Question 14

Many students confused perimeter and area and a significant proportion made no attempt in parts (b) and (c). Part (a) was answered quite well with part (a)(i) being done better than part (a)(ii), where many students did not subtract the area of the window.

By far the most common method used in part (b) was to split the front wall and door into a rectangle and triangle and those students who knew how to find the area of a triangle were generally successful. Many students attempted to work out the area of the triangle by subtracting the area of the rectangle from the given 4.92. Schools are reminded that when a question asks a student to ‘show’ a solution all steps of the solution must be included.

Some students found part (c) very difficult. Many attempted to find the total area to be painted but not all managed this to do correctly. Following this, division by 5 was fairly often seen but multiplication by 2 was frequently forgotten. Those students who based their answer on the amount of paint required for each wall generally had some success.

Mark Range and Award of Grades

Grade boundaries are available on the Results statistics page of the AQA Website.

UMS conversion calculator www.aqa.org.uk/umsconversion