AQA

General Certificate of Secondary Education
November 2012

Mathematics   43603F

(Specification 4360)

Unit 3: Geometry and Algebra (Foundation)

Report on the Examination

General

This was the second Unit 3 foundation paper to be taken by students. The paper was accessible to the majority of students with no evidence of students being short of time.

Topics that were well done included:
- measuring to calculate perimeter
- congruent shapes
- interpreting a scale
- bearings
- formula in words
- coordinates.

Topics which students found difficult included:
- order of rotational symmetry
- expressions
- perimeter of a semi-circle
- generating a formula.

Question 1
This question was a good starter with part (a) very well answered. The common error was to add the two readings. In part (b), many students used incorrect money notation with £28.8 being the most common error. Some students gave £28.08 as their final answer. A small minority cubed the 24 before multiplying by 1.20.

Question 2
This question was generally very well answered. The most frequent incorrect method was to calculate the area of the rectangle.

Question 3
Almost all students gave correct answers for the numbers of line symmetry with most errors being on the second shape. Rotational symmetry proved to be more challenging, with a variety of incorrect answers.

Question 4
Almost all students gave correct answers to both parts.

Question 5
Part (a) was answered correctly by almost all students. However, in part (b) many added on the time difference giving a final answer of 5 hours. Others gave incorrect answers without showing any working.

Question 6

Responses to part (a) were excellent with many very clear explanations. In part (b) the most common error was to use 100 grams = 1 kg. A significant minority simply wrote $1.2 \div 6 = 0.2$ kg

Question 7
Both parts of this question were generally well answered. Incorrect methods usually involved $200 \div 7$ or $200 \div 75$.

Question 8
Part (a) was very well answered by almost all students. Part (b) was generally well answered, but the common error was to give an answer of ¾ for turning in the opposite direction. A few gave answers in degrees and others had difficulty simplifying $\dfrac{90}{360}$.

Question 9
Responses to this question were generally very good. A small proportion of students worked out the area correctly as 20 m², but then went on to write this as 400.

Question 10
Only a small majority of students chose the correct triangle. Part (b) was an excellent discriminator. Common errors were to omit any units, to choose the wrong shape after correctly calculating all three areas or to omit the ½ from the formula for the area of a triangle.

Question 11
Responses to parts (a) and (b) were mixed, with many students giving answers containing the letters *A*, *B* and *C*. The most common methods used in part (c) were trial and error or trial and improvement.

Question 12

All parts of this question were well answered, with drawing trapezia the most common errors in part (b).

Question 13
Part (a) was well answered with £128 as the common incorrect answer. Many good responses were seen in part (b) with the most successful realising that three small bottles were equivalent in volume to the large bottle. Students who calculated pence per litre often went on to an incorrect conclusion.

Question 14

This question was well answered by the majority of students with occasional errors such as 360 – 119, 87 – 32 and 87 + 32 seen.

Question 15
This question was challenging for many students with many incomplete solutions and a high proportion of non-attempts. Some students worked with 180° instead of 360°. Others simply worked out the three angles but made no reference to 360°.

Question 16
A majority of students gave a correct reflection in part (a). The common error was to reflect in the *y*-axis. In part (b), again, a majority gave a fully correct 180° rotation, although many gave 180° rotations about an incorrect centre, such as (1, 1).

Question 17
Students tended to score all or nothing on this question. Those who realised the need to measure *AB* and *BC* usually went on to calculate the number of bricks required correctly. The two most common errors were to calculate 48 × 250 to give an answer of 12 000 or to assume the shape was a quarter-circle and attempt to calculate the wall length from *A* to *C* using a radius of 48 metres.

Question 18
This question was not well answered. Common errors in part (a) were to use πr² or πr. In part (b) most students halved their answer to part (a) but did not add on the length of the diameter.

Question 19
Responses to all parts of this question were generally poor with few students appearing to know how to write a formula down. Many included units within their attempts. In part (c) many calculated the surface area giving 120 × 6 = 120. The other common answer was 20³ = 8000.

Those students who realised they needed to work out $\sqrt{20}$ usually went on to give a fully correct answer.

Question 20
Responses to parts (a) and (b) were generally good, although many students did not draw an accurate smooth curve. Part (c) was the least attempted question on the paper with only a minority of students giving both answers in the correct range. Common incorrect answers were 0 and 5.

Question 21
This question was quite well answered but in part (a) many students omitted brackets from their formula or omitted the ½ with resulting errors in their calculation. A significant number of students simply multiplied together all three values given. In part (b) many students did not realise they should multiply the answer to part (a) by 200. Some attempted to calculate surface area, while others gave 200³ or 200 × 8.3 × 3.2.

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