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Free-Standing Mathematics Qualification

Working in 2 and 3 Dimensions 6982

Foundation level

Report on the Examination

2008 examination – June series

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Working in 2 and 3 Dimensions 6982 Examination

General

The marks achieved on this paper were quite evenly spread across the full range from 1 to 40. Candidates seemed to have plenty of time to attempt everything on the paper with just a small number of candidates omitting some questions.

The marks achieved varied widely from one centre to another, with candidates from some centres being well prepared and using methods confidently, but candidates from other centres not knowing which formulae or mathematical techniques to use. The shapes that can be expected in the questions are shown on the Data Sheet and it is disappointing that candidates from some centres do not seem to have revised the relevant methods. For example, the information on chocolate bars on the Data Sheet made it fairly obvious that questions would include triangles, yet from some centres there was not a single candidate who used the correct formula for the area of a triangle. Such centres are advised to make much better use of the Data Sheet to familiarise candidates with the contexts, remind them of the mathematical vocabulary that may arise and help them to practise the formulae and methods that may be needed.

Question 1

Candidates generally did well with this question. The majority gave the correct answer of 4 for the rotational symmetry of the diagram in part (a) with just a few giving incorrect answers, usually 8 or 2.

In part (b) many candidates also achieved full marks by drawing all the lines of symmetry in approximately the correct positions. A small number of candidates drew just one or two lines of symmetry, usually the vertical and/or horizontal lines and some candidates lost marks by including lines that were not lines of symmetry.

There was a variety of spellings offered for 'octagon' in part (c) but candidates were allowed the mark as long as it was clear which term they meant. A small proportion of candidates also said that the octagon was regular. A significant minority thought that the shape was a hexagon.

Question 2

Candidates from some centres found this question relatively straightforward and sometimes gave just the final answers for each part. This is sensible where only one mark is available, but it would have been better if they had included some working for part (b)(iii) where two marks are available. Occasionally a candidate seemed to make an error in working out 9×8 and lost both marks. This was a pity, as showing the method would have gained a mark. Some candidates gave the correct answers of 9 and 8 in (b) parts (i) and (ii) but then added these to give 17 as the answer to part (iii).

Candidates from a few of the centres could not tackle this question at all and it appeared that they had never solved such problems before. Some candidates made mistakes in converting the measurements into centimetres, occasionally giving answers such as 27 cm and 24 cm or 0.027 cm and 0.024 cm for part (a). Often they then reversed the numbers in the division or tried to find the answers to part (b) by sketching tiles on the diagram. Candidates should be advised not to use such methods when the words 'Not to scale' are written on diagrams.

Question 3

Only a small proportion of the candidates achieved full marks for this question.
A significant number used the formula for circumference instead of area and achieved no marks at all. A few of those who did use the correct formula then worked out $\pi \times 22.5 \times 2$ instead of $\pi \times 22.5^2$. Occasionally candidates lost a mark by using the diameter instead of the radius. Some candidates entered a calculation involving 45 and/or 360° which had no relevance to the question and did not include π. A significant minority omitted the question altogether.

In general, candidates find circle problems difficult and often do not achieve many marks on questions like this one. Centres are advised to look for possible circle questions in the contexts introduced on the Data Sheet and spend more time discussing them and practising the use of circle formulae before the examination.

Question 4

The diagrams produced for this question were generally accurate and well drawn. A common mistake was to omit the line across the base to show the bottom of the back of the washstand, but otherwise many diagrams were correct and achieved 4 out of the 5 available marks. Although the diagram itself was sufficient to gain these marks, most of the candidates wisely included the scale calculations. These were sometimes awarded a mark in cases where the diagram was not completed. Some candidates also wrote the actual or scaled measurements on their diagrams. This is helpful, but candidates should be advised to spend time doing only this if they are sure that they will still have ample time to complete the rest of the paper.

Unfortunately a few candidates lost most of the marks by drawing a good diagram but to the wrong scale, often 1:10. They were perhaps using a scale that they had used in class before the examination. It should be made clear to candidates that the scale required in the examination may well be different and that they should read through the question very carefully to find out what scale is required.

There were just a few very poor diagrams in which there was no attempt to use a scale or in which candidates had simply copied the diagram on the previous page instead of drawing a front elevation.

Question 5

The majority of the candidates got the first mark for recognising that the triangle was equilateral, with just a few giving 'isosceles' as the answer to part (a).

A large number of candidates achieved no marks for the rest of the question because they did not know the formula for the area of a triangle or the formula for the volume of a prism. Such candidates often simply added or multiplied the numbers on the diagram or tried to apply the formulae for the area of a rectangle and the volume of a cuboid.

Those candidates who did know the formula for the area of a triangle sometimes substituted 4 for the height instead of 3.5. However these candidates often achieved follow through marks in part (b)(ii) by multiplying their answer to part (b)(i) by the length of the prism.

A few candidates achieved full marks for part (b). Some of these worked out the area of the triangle again in part (b)(ii) rather than carrying it forward from part (b)(i). This meant that they took a little longer and ran the risk of making an error that could have been avoided if they had carried on from part (b)(i). Candidates who completed the calculations correctly also usually gave the correct units in each part.

Question 6

Most of the circles drawn for this question were correct, with just a few having a diameter of 4 centimetres instead of a radius of 4 centimetres. Candidates who drew such a small circle often had difficulty completing the rest of the question.

On many of the other scripts, candidates only achieved half marks for this question because they did not include any construction arcs. Some centres do not appear to have covered the use of compasses and ruler to construct a regular hexagon, although the Data Sheet clearly suggested that this might be required.

In many cases candidates lost an easy mark by not completing part (c) by drawing the diagonals of their hexagon.

Question 7

The majority of the candidates got the correct answer of 43.75 for this question, but many of them lost the final mark by omitting the units or giving incorrect units such as m^2 or cm^3.

Those candidates who did not get the right answer had often added the values or multiplied them in pairs, then added. In some cases it was not possible to follow the working at all. Finding the volume of a cuboid is such a frequent question on this paper that candidates should always revise the method in preparation for the examination.

Question 8

A large proportion of the candidates measured the angle correctly for part (a)(i). Just a small proportion gave inaccurate answers, measured the angle incorrectly to be 60° or gave the answer to be 90° or other incorrect angles. In part (a)(ii) a disappointingly small number of candidates realised that the angle would be the same in the actual sound studio. Many others multiplied or divided their answer to part (a)(i) by the scale factor, 50, even though this gave an unlikely large or small angle.

The majority of the candidates gave correct answers for the length of AL in part (b)(i) with just a few giving 3 cm instead of 30 mm. The answers given for part (b)(ii) varied widely. Some candidates were able to carry on from their answer to part (b)(i) by multiplying the length by the scale factor, then dividing by 1000 to convert millimetres to metres. Others achieved full marks by changing the length of AL to centimetres before multiplying by the scale factor and finally converting to metres. However, most of the candidates made one or more errors in this part of the question. Some ignored the scale factor whilst others divided by it instead of multiplying. A large number of candidates divided by 100 when trying to convert the units from millimetres to metres.

Question 9

Many candidates were able to achieve full marks for this question by subtracting the area of the rectangles and giving the result in the correct units.

Those candidates who did not get full marks often lost the last mark by not giving the correct units. Sometimes the units were given as m or m^3 and on other scripts omitted altogether. Some candidates achieved just one or two marks by finding the area of the outer and/or inner rectangle but not completing the solution correctly.

A small proportion of the candidates did not get any marks at all. Sometimes they had simply added or multiplied all the dimensions given on the diagram. In other cases they subtracted the lengths and widths of the rectangles before multiplying. A few of the candidates did not attempt the question.

Portfolio
FSMQ Foundation Level – June 2008

The portfolios submitted by many centres were of a good standard and the Specification for each unit was followed carefully. However, just a few centres did not study the requirements in enough detail and this resulted in inappropriate tasks being undertaken by candidates. It is in the spirit of FSMQ that work from other subjects should form the basis for tasks but these tasks must fulfill the requirements.

Centres submitting **Managing Money** portfolios produced some good work with excellent use of spreadsheets. Centres sometimes did not encourage independent work by candidates, which restricted the marks attainable in Strand One. For a mark of over 40, considerable work on fractions must be carried out.

Making Sense of Data portfolios showed good independent work with reference to candidates' work in other subjects, which was encouraging. A few centres did not appreciate the twelve elements that must be present for a 'complete' portfolio.

It was pleasing to see more portfolios submitted under '**Working in 2 and 3 Dimensions'**. There was a strong link to other areas of technology in these portfolios and this is to be encouraged.

Overall, candidates exhibited independent work in a variety of fields and were able to explain their findings in straightforward terms.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the **Results statistics** page of the AQA Website.