edexcel

Principal Examiner Feedback

November 2011

GCSE Mathematics (5384H)
Paper 14H (Calculator)

Edexcel is one of the leading examining and awarding bodies in the UK and throughout the world. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers.

Through a network of UK and overseas offices, Edexcel's centres receive the support they need to help them deliver their education and training programmes to learners.

For further information, please call our GCE line on 0844 576 0025, our GCSE team on 0844 576 0027, or visit our website at www.edexcel.com.

If you have any subject specific questions about the content of this Examiners' Report that require the help of a subject specialist, you may find our **Ask The Expert** email service helpful.

Ask The Expert can be accessed online at the following link:
http://www.edexcel.com/Aboutus/contact-us/

November 2011
Publications Code UG029747

1. PRINCIPAL EXAMINER'S REPORT – HIGHER PAPER 14

1.1. GENERAL COMMENTS

1.1.1. This is a calculator paper. It was evident from some work that candidates were attempting the paper without the aid of a calculator. This is not advisable, since calculation errors will cost marks.

1.1.2. The inclusion of working out to support answers remains an issue.

1.2. REPORT ON INDIVIDUAL QUESTIONS

1.2.1. Question 1

In part (a) there were many correct attempts without any working shown. Weaker candidates rearranged incorrectly, showing evidence of taking 7 from 28.

More method was shown in part (b), and more marks were therefore earned by weaker candidates than in the first part.

1.2.2. Question 2

It was disappointing to find many solutions spoilt by incomplete working. Errors included incorrect percentage calculation, or failure to include the 24 payments of £26. It was surprising to see cases where candidates calculated the 20%, but then added this back onto the £650, perhaps incorrectly following an "increase in VAT" method. A significant minority worked out the credit price but failed to find the difference with the cash price.

1.2.3. Question 3

There still remains confusion about plans & elevations. Many candidates still confuse them regularly with nets, and indeed many nets were seen in either part, most commonly in part (b). Some attempted 3D drawings.

1.2.4. Question 4

There is always the temptation to work out the value of numbers with indices when a calculator is available, and much of it was seen in this question. Unfortunately candidates then had difficulty in handling the large numbers, and in converting back into a power of 6 at the end. Those who understood rules of indices were able to gain some credit if their final answer was incorrect.

In part (b) a common error was to add the indices.

1.2.5. Question 5

A significant minority attempted this question using the formula for area of a circle. Some used $2\pi d$ or πr instead of $2\pi r$.

Many gained full marks.

1.2.6. Question 6

This question was quite well done. Most candidates correctly anticipated the need to add together the given expressions for the two angles, and clearly showed this in their notes. Many related their algebra back to the given equation and the angle y as required, but those who left their justification of $3x + 40$ alone failed to fully justify the equation. In moving to the given equation many also gave written explanations which provided more evidence to help examiners award the marks, but some of these written explanations lacked clarity; some not even referring to angles.

In part (b) candidates were not always secure in solving the equation, with too many errors in rearrangement. Some candidates appeared happy to give values of x which failed to give sensible sizes of angle. In the last part it was common to see just one attempt at substitution into an angle expression, without any attempt to find the largest angle.

1.2.7. Question 7

Division by a ratio remains a weakness. This question was not well done, even by brighter candidates. Division of £28 by 13, 12 and 10 was seen regularly, as was division in the ratio 1:2:3 (possibly a failure to read the question properly). An independent mark was awarded for calculating $\frac{2}{3}$, where this working was shown. It is interesting to note that many did this as a multi-step calculation by division of 3 and subtraction, rather than just finding $\frac{2}{3}$.

1.2.8. Question 8

There was much evidence of conversion of monetary values, but not always appropriately. Most candidates chose a value of money to convert into both £ and € to enable a comparison to be made. The simplest approach was to change just one of the exchange rates into its reverse rate, thereby enabling an instant comparison to be made, but this was rarely seen. Errors made by many candidates was in choosing different amounts of money to convert, or the same amount of money converted by multiplying by each of the conversion rates, thereby rendering a comparison impossible.

1.2.9. Question 9

Most candidates knew how to find the area of a triangle. Only having two lengths meant that a common incorrect approach was to use these two values to find the area, or alternatively estimate the length of the height from the diagram. Of those realising that a Pythagoras calculation was needed, a sizeable minority chose to add the squares rather than taking them away. Even though this gave them a height longer than the hypotenuse they still felt it plausible to work out the area. This is a question in which a common-sense approach was needed by many candidates.

1.2.10. Question 10

There were very few correct answers to this question. Most commonly it was assumed the gradient was 2 again, and equations that were just slightly different from the one given were written down.

1.2.11. Question 11

Most candidates scored at least 1 mark for this question, probably as a result of demonstrating the correct process to rearrange the equation, or getting as far as 2.5. Many lost the final mark, usually because they used an incorrect inequality sign, or gave the answer using an equality sign. This mark was also lost by candidates who showed $x > 2.5$ in their working, but then put only 2.5 on the answer line; examiners have to accept the final declared answer of the candidates, and in this case this only gained 1 mark.

1.2.12. Question 12

Most candidates attempted to relate corresponding sides and find multiples or scale factors, but this was not done well. It was too easy for some to consider $\frac{15}{6}$ or $\frac{6}{15}$ directly with 12.5, which then led to incorrect working. Those who used $\frac{15}{21}$ usually went on to gain full marks, as did candidates who drew two separate triangles to work with. Even though the triangles were not right- angled, some attempted to use Pythagoras.

1.2.13. Question 13

Many candidates obtained the last three points, but the calculation from $x = -1$ was commonly done wrong. Plotting was usually done well, with candidates rarely put off by the numbers to 3 decimal places. It was disappointing when these correctly plotted points were then joined with straight line segments rather than a curve, not uncommon. Examiners can allow some tolerance on curves drawing, but at the very least they have to be drawn through their plotted points.

1.2.14. Question 14

Candidates were asked for exact solutions. This meant that both solutions had to be stated and using surd form. Full marks could not therefore be gained by giving the decimal solutions alone, though if these were given alongside the surd forms full marks were still awarded. There were many trial and improvement approaches but these inevitably led to only one decimal solution so no marks were earned. Rearrangement to a quadratic equation was sufficient for the first mark. Substitution into the formula for solving quadratic equations was indication of making progress with this question and where further marks were gained.

1.2.15. Question 15

Typically with this question we have different ways of getting to the solution, and all different appropriate methods were credited. The Cosine Rule was the most common method seen, and the most direct route to an answer. Most used 62° as the angle, and the only common error was in working out Cosine Rule in an incorrect order of operations. There were few instances of candidates using calculators in the wrong mode. Some assumed the triangle PQR was right-angled and attempted to use Pythagoras.

1.2.16. Question 16

Proof of congruent triangles requires candidates to use geometrical reasoning, linking corresponding sides and/or angles, and arrive at a clearly stated conclusion with regard to the reasons for congruency, and supported by working. Candidates were asked to give reasons for each stage in their working; in many cases this was not show, or reasons given failed to relate to the stated geometrical properties of the shape in the diagram. Some solutions were spoilt when sides were linked which were not corresponding in some way. It was not sufficient to merely state “they are congruent” but the reasoning (3 sides, ASA, SAS etc.) had also to be given, and these needed to be supported by working out given. Very few candidates were able to give a complete proof, but some marks were given where candidate did start to link corresponding sides.

1.2.17. Question 17

Rounding numbers to maximum and minimum limits within which the given number can lie is a well understood topic. Candidates should not assume this is always $\pm\frac{1}{2}$ unit. Finding at least one of these limits for 64.5 was well done; finding at least one of the limits for 2000 was less well done, since the phrase “correct to 1 significant figure” was not well understood. There were many who used 2000.5 as a result. Candidates also had to have an appreciation that this required division of the maximum area by the minimum length, and again this was problematic, with many choosing either both maximums, or both minimums. As a result this question was a challenge, and very few gained full marks.

GRADE BOUNDARIES

Grade boundaries for this, and all other papers, can be found on the website on this link:
http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx

Further copies of this publication are available from
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467
Fax 01623 450481
Email publication.orders@edexcel.com

Order Code UG029747 November 2011

For more information on Edexcel qualifications, please visit
www.edexcel.com/quals

Ofqual

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Rewarding Learning