Principal Examiner Feedback

Summer 2010

GCSE Mathematics (2381)

Paper 5381H_06

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/

1. PRINCIPAL EXAMINER'S REPORT – HIGHER PAPER 6

1.1. GENERAL COMMENTS

1.1.1. The paper proved to be accessible to most candidates with the majority of candidates attempting all questions.

1.1.2. Candidates appeared able to complete the paper in the allotted time.

1.1.3. The need for clear presentation and showing all the working cannot be over-emphasised. Partial credit cannot be awarded unless a clear method can be seen which could lead to the correct answer.

1.1.4. It was evident in this examination series that candidates often did not read the question carefully. For example, in B1(b) candidates often estimated the number of times the spinner would land on D.

1.2. REPORT ON INDIVIDUAL QUESTIONS

1.2.1. Question A1
Part (a) was generally well done with the concept of the stem and leaf diagram being well understood. Over 77% scored all three marks on this question with a further 16% scoring two marks for either one error or an error in the key. Most errors were due to careless slips. The key proved a problem for a small minority of candidates. Some candidates work was difficult to read because they used their final diagram as a check list. A number of students did not order the data. Quote a few candidates lost a mark for missing out one of the three 6s in their table.76% of the candidates were successful in writing down the mode. Those that got it incorrect tended to not veer towards any specific incorrect response.

1.2.2. Question A2
The most common answer on the answer line was 3. Unfortunately, this gained no credit unless working was shown. Candidates were not penalised if they found the correct answer and then gave a rounded value on the answer line. 41% of candidates scored all 3 marks. Several candidates seemed to throw techniques at this question at random, still demonstrating all the traditional misconceptions that occur when finding the mean of tabulated data. Of particular concern is the number of candidates who found the correct total people but then shared this out equally between 15 or 5 caravans, instead of 40. Nearly 40% of candidates failed to score any marks.

1.2.3. Question A3

This question tested the abilities of many candidates. Two comparisons were expected and to gain full marks at least one of these had to be a comparison of spread. Often, the range or interquartile range was used, although other wording such as "spread" and "distributed less" were allowed. Many candidates showed that they did not know the difference between the range and the interquartile range, and some did not relate these measures to real life, but merely referred to the shape of the box and whisker diagrams. Others wrote that the interquartile range in B was larger than in A, clearly not understanding the diagram. Some candidates tried to compare the skewness of the distributions, many with good success. Quite a few candidates could see the overall picture the data showed but phrased their answer incorrectly – they referred to regions not craters, and used words like bigger and smaller, not deeper. Also, many candidates used expressions such as "the depth is longer," which clearly showed that they were comparing the shapes of the diagrams as opposed to relating it to the depth of the craters. Candidates who kept their answers brief tended to do best eg "The median for Region B was deeper". Two thirds of the candidates scored at least 1 mark with 20% scoring both available marks.

1.2.4. Question A4

Over 83% of the candidates knew what a moving average was and could perform the calculations accurately. Unfortunately, a few forgot to divide by the three to get the correct answer. The most common incorrect answer was from candidates that clearly had no idea about moving averages and thought they had spotted that Jan to Feb was +12, Feb to Mar was +6 and Mar to Apr was +12. They then did 33 + 12 and 45 + 6 providing an answer of 45, 51.

1.2.5. Question 5

Even though this is a high grade topic, over 54% of candidates got part (a) correct and 49% got part (b) correct. For those that did not score, the heights often matched the frequency rather than the frequency density. There was a lack of understanding of how to construct bars in a histogram as frequency density was not well understood. A significant number left the question unanswered. A few candidates drew the correct heights in (b) but the width of the second bar extended to 52.5.

1.2.6. Question A6

Around 38% were able to correctly work out the number of female students in the sample with a height less than 150 cm. A further 5% scored 1 mark, generally losing the final mark for not rounding their answer to a whole number. A common incorrect answer was 56, ie a repeat of the number in the original data. Generally, those who knew the method kept their response brief and answered the question correctly. A major contribution to lost marks was not rounding their calculated answer. Some candidates only added the numbers of females and found the sample out of 151 females only. Others multiplied their fraction by 100 instead of by 50 leading to an incorrect answer of 18 or 19 in both cases. Others added the males and females incorrectly and did not use the 290 given. Some candidates did not read the question very carefully and found the number of male students under 150 or female between 150 and 160.

1.2.7. Question B1

Most candidates managed this question successfully with 73% of candidates scoring all 4 marks and only 4% scoring 0 or 1 mark. In (a) some correctly added the 4 given probabilities together with 0.85 shown, but then did an incorrect subtraction of 0.85 from 1.
1 – 0.85 = 0.25 was the most common error. Most candidates knew that all five probabilities had to add up to 1, and scored one mark for a subtraction of their addition of the other four from 1. Marks were given for implied subtraction, but some students showed no working at all, thereby risking getting no marks. Other students gave an answer of 15 as they had abandoned the decimal points in their working, and forgotten to put it back in their final answer. 1 mark was given for this. Another error was to give 0.15 in the working or in the table but then incorrectly convert this to 1/5, and give this on the answer line.
In part (b) mistakes were often made by students misreading question and using the 0.15 answer from part (a) to get their solution. Other mistakes included leaving their answers as a fraction, decimal or percentage.

1.2.8. Question B2

Part (a) answered correctly by over 90% of the candidates. For those who did not score here, they either left it blank or wrote 'going up', 'increasing', 'negative', 'high correlation', 'good correlation' or described the relationship between the two variables. Part (b) was also answered very well with 92% of candidates scoring the available mark. A few were out of range and several read off the wrong scale finding an estimate for age rather than price.

1.2.9. Question B3

To gain full marks on this question candidates had to cover three aspects – give a suitable question, have no overlapping response boxes and include some mention of units, in their response boxes or in the question. If a candidate's response only included one or two of these aspects, then just one mark was awarded. A lot of responses were over complicated, some with extra, irrelevant questions. Other candidates lost marks for overlapping response boxes. A few candidates produced a tally chart instead. It was pleasing to note that around 54% of the candidates scored both marks whilst a further 42% scored 1 mark.

1.2.10. Question B4

In part (a) most students managed to calculate the cumulative frequency correctly. Those that scored no marks had failed to understand the concept of 'cumulative' and had manipulated the numbers in the frequency table in a variety of ways, such as adding adjacent numbers, which gave 5,17,35,39,20. Also a response of 5,10,15,20,25 was seen on a number of occasions. In part (b) many candidates did correctly plot the cumulative frequency graph at the correct position with consistent intervals joined by a curve or line segments. Some candidates who managed to plot the points in the correct position failed to join them up whilst others plotted the points correctly, but then proceeded to draw a line of best fit. Other candidates plotted the cumulative frequency values at mid-intervals but fewer did this than in previous years. In part (c) many students accessed the mark for providing a value in the required range. I was pleased to note that half the candidates scored all 4 marks for this question with a further 20% scoring 3 marks.

1.2.11. Question B5

This question proved quite difficult for the least able candidates with 41% failing to score any marks. However there were also some excellent responses with 38% scoring all three marks. Manipulation of fractions within the working is clearly an area of weakness for many candidates. Many found great difficulty in combining fractions together. $\frac{2}{7} \times \frac{1}{6} = \frac{3}{42}$ was commonly seen leading to an incorrect answer of $\frac{23}{42}$ and there was a lot of evidence of poor arithmetic in multiplying 7 by 6 as well as adding denominators when trying to add fractions. Many candidates failed to read the question clearly and forgot about the counter not being replaced. Others ended up drawing a tree diagram which involved taking 3 instead of 2 counters.

1.2.12. Question B6

This question proved quite difficult for the least able candidates with 41% failing to score any marks. However there were also some excellent responses with 38% scoring all three marks. Manipulation of fractions within the working is clearly an area of weakness for many candidates. Many found great difficulty in combining fractions together. $\frac{2}{7} \times \frac{1}{6} = \frac{3}{42}$ was commonly seen leading to an incorrect answer of $\frac{23}{42}$ and there was a lot of evidence of poor arithmetic in multiplying 7 by 6 as well as adding denominators when trying to add fractions. Many candidates failed to read the question clearly and forgot about the counter not being replaced. Others ended up drawing a tree diagram which involved taking 3 instead of 2 counters.

2. STATISTICS

2.1. MARK RANGES AND AWARD OF GRADE

Unit/Component	Maximum Mark (Raw)	Mean Mark	Standard Deviation	% Contribution to Award
5381F/05	30	19.2	5.8	20
5381H/06	30	20.3	6.5	20
5382F/07	25	14.0	4.1	15
5382H/08	25	14.6	4.9	15
5383F/09	25	13.2	4.6	15
5383H/10	25	13.5	5.2	15
5384F/11F	60	30.6	12.1	25
5384F/12F	60	36.1	12.4	25
5384H/13H	60	32.8	10.7	25
5384H/14H	60	36.8	11.7	25

GCSE Mathematics Grade Boundaries for 2381 – June 2010

The table below gives the lowest raw marks for the award of the stated uniform marks (UMS).

Unit 1 – 5381

	A*	A	B	C	D	E	F	G
UMS (max: 55)				48	40	32	24	16
Paper 5381F				24	20	16	12	8
UMS (max: 80)	72	64	56	48	40	36		
Paper 5381H	29	25	19	13	9	7		

Unit 2 Stage 1 – 5382

	A*	A	B	C	D	E	F	G
UMS (max: 41)				36	30	24	18	12
Paper 5382F				19	15	12	9	6
UMS (max: 60)	54	48	42	36	30	27		
Paper 5382H	23	19	14	10	9	8		

Unit 2 Stage 2 - 5383

	A*	A	B	C	D	E	F	G
UMS (max: 41)				36	30	24	18	12
Paper 5383F				18	15	12	9	6
UMS (max: 60)	54	48	42	36	30	27		
Paper 5383H	22	18	14	10	6	4		

Unit 3- 5384

	A*	A	B	C	D	E	F	G
5384F_11F				44	34	24	15	6
5384F_12F				50	40	30	20	10
5384H_13H	53	43	33	24	14	9		
5384H_14H	59	48	37	27	15	9		

	A*	A	B	C	D	E	F	G
UMS (max: 139)				120	100	80	60	40
5384F				94	74	54	35	16
UMS (max: 200)	180	160	140	120	100	90		
5384H	111	91	71	51	29	18		

UMS BOUNDARIES

Maximum Uniform mark	A*	A	B	C	D	E	F	G
400	360	320	280	240	200	160	120	80