IGCSE Mathematics (0580) Examiner's Reports

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Paper 1 Questions 7 & 16

Question 7

This question proved demanding for the majority of candidates. A common error was in calculating the size of the exterior angle instead and stating the answer as 36°. It was rare to see this value then correctly used to find the interior angle $(180 - 36 = 144)$. Those candidates who used the expression $(n-2)x180$ often then failed to divide by $n(10)$ or used a different value of n altogether.

Answer: 144.

Question 16

A significant number of candidates failed to appreciate the methods to be used in this question. Those who did apply the correct methods were generally successful, although a significant number then failed to give the answer to the required level of accuracy. A common error in **(a)** was 25+4=29 instead of 25-4=21. In **(b)** a number of candidates were unable to go from $\cos(x) = \frac{2}{5}$ to $x = \text{inv.cos}\left(\frac{2}{5}\right)$.

Answers: **(a)** 4.58; **(b)** 66.4.

Paper 2 Questions 10 & 18

Question 10

This question was not very well answered with few candidates scoring all three marks. There was some confusion as to whether the start should be $F = kv$ which was very common, $F = kv^{1/2}$ or $F^2 = kv$ rather than $F = kv^2$. Premature approximation for the value of k often prevented the more able candidates from achieving a correct final value.

Answer: 11.5.

Question 18

Standard form was generally well done. About half of the candidates correctly answered **(b)** with the exception of writing the answer correct to the nearest whole number which was not well understood. Correct solutions to the last part were very rare, with most candidates not knowing that there are 1, 000, 000 m^2 in a square kilometre.

Answers: **(a)** 5.8×10^8; **(b)** 98; **(c)** 10200.

Paper 3 Question 5

Question 5

(a) Some candidates reversed the signs, and some confused the x and y directions. Frequently 4 was given instead of –4.

(b)(i) The Examiners were looking for the correct words for the transformations, although in this case 'turn' was allowed for 'rotation', and 'half turn' for 'rotation of 180°'. Candidates should be encouraged to learn the words transformation, rotation, translation, enlargement and reflection as is required in the syllabus. The most common errors were to leave out the centre of the rotation or to give 'reflection' as the answer.

(ii) In this case 'made larger' was not accepted for 'enlargement'. Enlargement followed by 3 was just acceptable as the scale factor, but again, for the best marks the candidates should write 'scale factor 3'. H was sometimes given as the centre of the enlargement.

These types of questions appear so frequently in the examination papers it is perhaps worth spending a little extra time on the topic. It should be possible for candidates to get high marks for transformations. Encouraging the use of tracing paper would be beneficial.

(c)(i) Some candidates gave the area of the triangle as $2 \times 3 = 6$.

(ii) This was not so well done, some lost a mark for the answer not in its lowest terms, but a mark was available for the number 27 seen.

(d) The best way to give the gradient is as a fraction. Decimals are acceptable, but as with the probabilities they introduce the problem of rounding. One mark was available for the correct fraction or decimal, and one for the negative sign.

Answers: **(a)** 6, –4; **(b)(i)** rotation, 180°, about (2.5, 6), **(ii)** enlargement, scale factor 3, centre (1, 7) (or B); **(c)(i)** 3, **(ii)** 1:9; **(d)** $-\frac{2}{3}$.

Paper 4 Questions 4 & 5

Question 4

Most were able to plot the given points and draw the curve. Inevitably some were not accurate enough with their plots or ignored the word "curve" in the question and joined the points linearly.

Weaker candidates often were unable to calculate $f(8)$ and $f(9)$. Even those who did were not always able to recognise the limiting value of the function.

Most could draw a reasonable tangent at the right place. Some tried to use the coordinates of points on the curve rather than on the tangent to find the gradient. Provided a good tangent had been drawn, the answer for the gradient had to be correct for that tangent. Most omitted to suggest what quantity the gradient represented – the most common wrong answer here was distance.

The line for $g(t)$ should have been ruled and extended from (0, 10) to (7, 52). The answer for the range of values of t had to be between the two t-values of the points of intersection of the candidate's line and curve, which had to be correct for *their* graph. No marks were available in the final part unless the reason given referred to the *area* under the curve representing the distance travelled. Many thought $f(t)$ travelled further because it was a curve rather than a line, or because the velocity was greater at times.

Answers: **(b)(i)** 49.8, 49.9, **(ii)** $\approx$ 50; **(c)(ii)** Acceleration or m/s^2 o.e.; **(d)(iii)** Distance given by area under graph $\Rightarrow$ $f(t)$ travels further.

Question 5

This relatively simple question often exposed a lack of deeper understanding about probability and caused many candidates considerable mark loss.

The first problem arose with the probability that the card is red *or* D. Most happily translated the word "or" into "+" without thought of any overlap in their counting, so 0.4 + 0.2 = 0.6 was the most common answer seen.

Similarly in the next two parts the word "and" became "×" without any further consideration, so "red and D" became 0.4 × 0.2 = 0.08 and "red and N" became 0.4 × 0.1 = 0.04.

All three problem parts were sometimes dealt with correctly by weaker candidates who simply asked themselves each time how many cards fitted the criteria and found that five cards were either red or D, only one was a red D and none at all were red Ns.

When two cards were chosen the most common error was not to realise that the second card was picked after the first one had gone, which affects both the numerator and denominator of the second fraction. Thus for both Ds, 2/10 × 2/10 or 2/10 × 1/10 were seen instead of 2/10 × 1/9.

Most did get some credit for realising they should add their probabilities for both Ds and both As to get the probability that both cards were the same. Luckily only a few attempted to find the probability of two different cards without using 1 – their previous answer.

There was still a small number of candidates who did not know that probabilities cannot be expressed with a ratio symbol as this has a different meaning – odds. So an answer of 1: 5 is actually giving odds of 1 to 5 and hence a probability of 1/6, which is wrong.

Answers: **(a)(i)** 0.2 (or equivalent), **(ii)** 0.4, **(iii)** 0.5, **(iv)** 0.1, **(v)** 0; **(b)(i)** 1/45, **(ii)** 1/15, **(iii)** 4/45, **(iv)** 41/45.