Rewarding Learning

General Certificate of Secondary Education
January 2011

Mathematics

Module N6 Paper 2
(With calculator)
Higher Tier

[GMN62]

FRIDAY 14 JANUARY

10.45 am – 12.00 pm

MARK SCHEME

GCSE MATHEMATICS JANUARY 2011

Introduction

The mark scheme normally provides the most popular solution to each question. Other solutions given by candidates are evaluated and credit given as appropriate; these alternative methods are not usually illustrated in the published mark scheme.

The marks awarded for each question are shown in the right hand column and they are prefixed by the letters **M**, **A** and **MA** as appropriate. The key to the mark scheme is given below:

M indicates marks for correct method.

A indicates marks for accurate working, whether in calculation, readings from tables, graphs or answers.

MA indicates marks for combined method and accurate working.

The solution to a question gains marks for correct method and marks for an accurate working based on this method. Where the method is not correct no marks can be given.

A later part of a question may require a candidate to use an answer obtained from an earlier part of the same question. A candidate who gets the wrong answer to the earlier part and goes on to the later part is naturally unaware that the wrong data is being used and is actually undertaking the solution of a parallel problem from the point at which the error occurred. If such a candidate continues to apply correct method, then the candidate's individual working must be **followed through** from the error. If no further errors are made, then the candidate is penalised only for the initial error. Solutions containing two or more working or transcription errors are treated in the same way. This process is usually referred to as "follow-through marking" and allows a candidate to gain credit for that part of a solution which follows a working or transcription error.

It should be noted that where an error trivialises a question, or changes the nature of the skills being tested, then as a general rule, it would be the case that not more than half the marks for that question or part of that question would be awarded; in some cases the error may be such that no marks would be awarded.

Positive marking:

It is our intention to reward candidates for any demonstration of relevant knowledge, skills or understanding. For this reason we adopt a policy of **following through** their answers, that is, having penalised a candidate for an error, we mark the succeeding parts of the question using the candidate's value or answers and award marks accordingly.

Some common examples of this occur in the following cases:

(a) a numerical error in one entry in a table of values might lead to several answers being incorrect, but these might not be essentially separate errors;

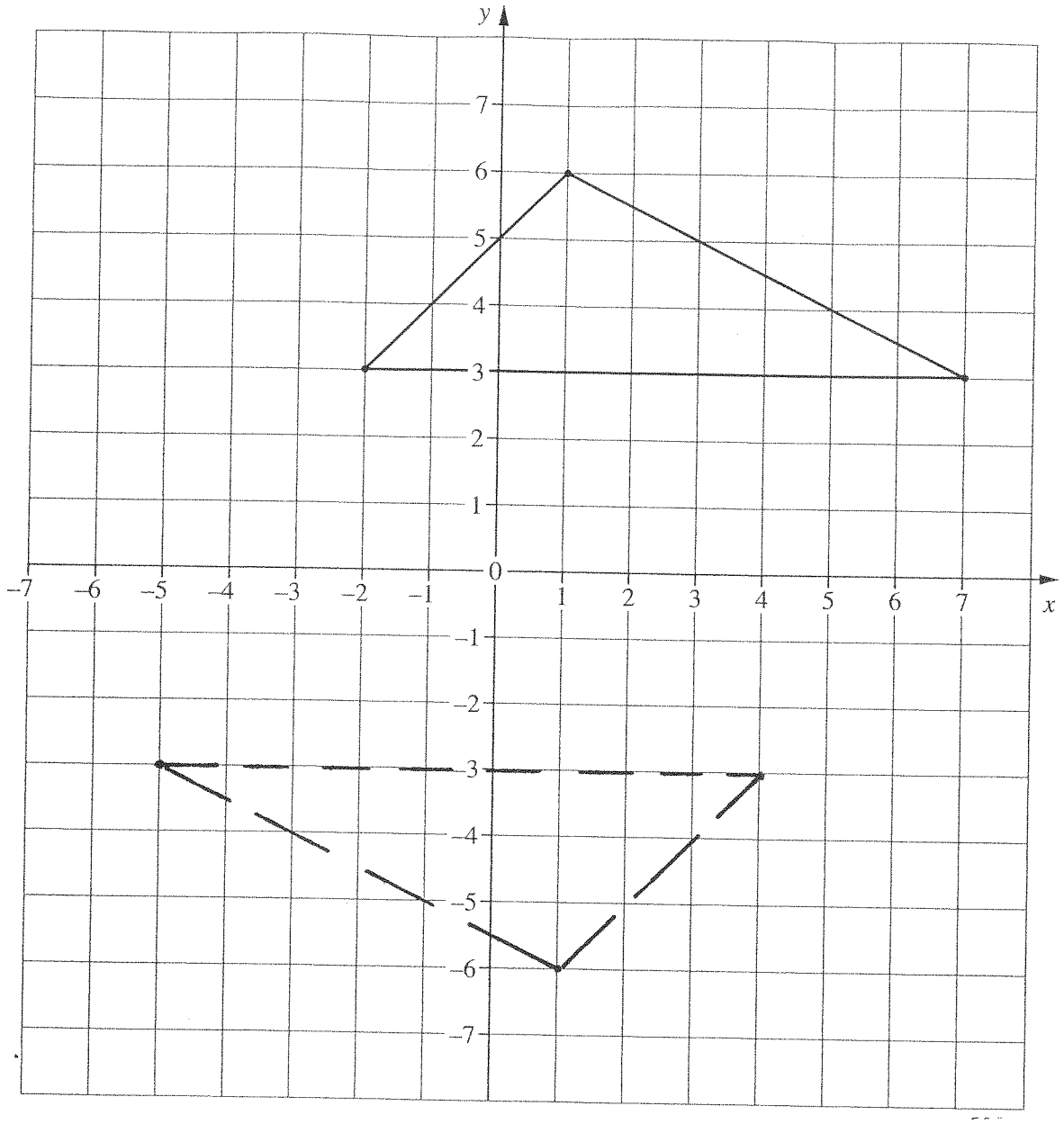
(b) readings taken from candidates' inaccurate graphs may not agree with the answers expected but might be consistent with the graphs drawn.

When the candidate misreads a question in such a way as to make the question easier only a proportion of the marks will be available (based on the professional judgement of the examiner).

			AVAILABLE MARKS
1	1500000 ÷ 135.457 = 11074	MA1	
	11074 ÷ 1.09608 = 10103	MA1	
	12000 –10103 = 1897	MA1	
	Japan, 1897	A1	4
2	Could be odd or even because	MA1	
	(suitable examples)	A1	2
3	**(a)** 5.05 to 5.10	MA1	
	(b) 1.0 + 0.6 = 1.6 km	M1 A1	
	(c) 8.4 km in 15 mins = 33.6 km/h	M1 A1	
	(d) 2 km	M1 A1	7
4	**(a)** P(Black) = 1 – (0.3 + 0.5 + 0.14)	MA1	
	= 0.06	A1	
	(b) P(Green or Blue) = 0.14 + 0.5	M1	
	= 0.64	A1	4
5	**(a)** 4 horizontal cubes on base	A1	
	2 end cubes on 2nd layer	A1	
	(b) **(i)** $8 \times 6 + 3 \times 4 - 4 \times 2 = 52\,cm^2$	M1 A1	
	(ii) 8 + 10 + 3 + 4 + 5 + 6 + (2 + 4 + 2 + 4) = 48 cm	M1 A1	6
6	**(a)** Perpendicular bisector constructed	M1 A1	
	(b) Correct Enlargement (−5,−3), (4,−3), (1,−6)	M1 A2	5
7	180 ÷ 15 = 12	MA1	
	48 + 60 = 108	M1 A1	3
8	**(a)** 10 4	A1 A1	
	(b) Correct graph to include – correct points plotted/max point/curve	A2	
	(c) *x* values of –3.3 and 0.3	A2	6

			AVAILABLE MARKS
9	Curved surface area = $2 \times \pi \times 4 \times 12$	M1	
	$= 301.6$	A1	
	Approp. acc. 300	A1	3
10	$\frac{2.675\times10^5}{1.775\times10^6}\times100$	MA1	
	15.07	A1	2
11	$PQ = PR$ (isosceles triangle given) $PT = PS$ (given in question) Angle P same in both	A1	
	By *SAS* triangles *PQT* and *PRS* are congruent	A1	
	Angle *PQT* = angle *PRS* by previous congruency, therefore since angle Q = angle R in original triangle, by subtraction, angle *UQR* = angle *URQ*. Hence triangle *QUR* must be isosceles.	M1 A1	4
12	$x = 0.83333....$ $10x = 8.3333....$ $100x = 83.3333....$ $90x = 75$ or equivalent	MA1	
	$x = \frac{75}{90}\left(=\frac{5}{6}\right)$	A1	2
13	**(a)** $0.5 \times 0.7 = 0.35$	A1	
	(b) P (Mark fails) $= 0.5 \times 0.8$ P (Julie fails) $= 0.2 \times 0.7$	MA1	
	0.4×0.14	M1	
	0.056	A1	4
14	**(a)** $\frac{x-2}{x}=\frac{3(x-2+1)}{x+15}$	MA1	
	$\frac{x-2}{x}=\frac{3(x-1)}{x+15}$ $(x-2)(x+15) = 3x(x-1)$ $x^2 + 13x - 30 = 3x^2 - 3x$ $2x^2 - 16x + 30 = 0$ $x^2 - 8x + 15 = 0$	MA1	
	(b) $(x-3)(x-5) = 0$ $x = 3$ or 5	MA1	
	Original Fraction = $\frac{3}{5}, \frac{1}{3}$	A1	4
		Total	**56**

GCSE MATHEMATICS JANUARY 2011
MODULE N6-2
OVERLAYS QUESTION 6B



GCSE MATHEMATICS JANUARY 2011
MODULE N6-2
OVERLAYS QUESTION 8B