Version 1.0

ASSESSMENT and QUALIFICATIONS ALLIANCE

Free Standing Mathematics Qualification

Making Connections in Mathematics
6987

Mark Scheme

2005 examination – June series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Free-Standing Mathematics Qualification
Foundation Level: Making Connections in Mathematics (6987)
June 2005

Answers and Marking Scheme

Question 1

(a)(i)	Line B: 245 multiplied by 8	B1	
(ii)	Line A is 245 × 10, so Line A + Line B gives 245 × 18	B1	
(b)	<table><tr><td></td><td>300</td><td>10</td><td>5</td><td></td></tr><tr><td>10</td><td>3000</td><td>100</td><td>50</td><td>3150</td></tr><tr><td>4</td><td>1200</td><td>40</td><td>20</td><td>1260</td></tr><tr><td></td><td></td><td></td><td></td><td>4410</td></tr></table>	B1 B1	1st row correct 2nd row and answer correct
	TOTAL	**4**	

Question 2

(a)(i)	$14 = 2 \times 7$	B1	
(ii)	$315 = 3 \times 3 \times 5 \times 7$	B1	
(b)	Explanation / demonstration that $245 \times 18 = 315 \times 14$ by expressing as product of prime factors $245 \times 18 = 3.5 \times 14$ $5 \times 7 \times 7 \times 2 \times 3 \times 3 = 3 \times 3 \times 5 \times 7 \times 2 \times 7$ B1 B1 Some attempt to explain equivalence B1 eg $2 \times 3 \times 3 \times 5 \times 7 \times 7 = 2 \times 3 \times 3 \times 5 \times 7 \times 7$	M1, A1 A1	Any attempt to use prime factors accurately
(c)	Any product of two integers from $2 \times 3 \times 3 \times 5 \times 7 \times 7$	B1	Allow 1×4410
(d)	$13\,230 \div 54 = 13\,230 \div (3 \times 18)$ $= 4410 \div 18$ $= 245$	 M1 M1	Must show some argument Using $54 = 3 \times 18$ Using $245 \times 18 = 4410$
	TOTAL	**8**	

Question 3

(a)	$\angle ABL$	B1	Condone missing $\angle$ sign
(b)	$\angle CBM$	B1	as above
(c)	$\angle ABL + \angle CBM + \angle ABC = 180^0$ $\therefore \angle CAB + \angle BCA + \angle ABC = 180^0$	B1 B1	Angles on a straight line Use of parallel lines
	TOTAL	**4**	

Question 4

(a)	Polygon Name	Triangle	Quadrilateral	Pentagon	Hexagon		
	Number of sides, n	3	4	5	6	B1	T row completed correctly
	Number of triangles, T	1	2	3	4	B1	S row completed correctly
	Angle sum, $S°$	180	360	540	720		
(b)(i)	Correct graph					B1 B1√	Scaling consistent Points plotted correctly
(ii)	Polygons only have an integer number of sides					B1	
(c)(i)	$S = 180(n-2)$					M1 A1	180* something or 90* something or right angle * something
(ii)	$n = 3, 4, 5 ... etc.$					B1	
(d)	When $n = 5$ $2n - 4 = 10 - 4 = 6$ so angle sum = $6 \times 90^\circ = 540^\circ$					M1 A1	Evidence of substitution of $n = 5$
	TOTAL					**10**	

Question 5

(a)	120°	B1	
(b)	2 : 1	B1	Accept 2L : L must be in ratio notation
(c)	Centre: *O* or mid-point *AD (EH)* Scale factor: 2	B1 B1	
(d)	Same shape Same size	B1 B1	Anything suggesting "identical" B2
	TOTAL	**6**	

Question 6

(a)	$\frac{1}{4}$	B1	
(b)	$\frac{1}{16}$	B1	
(c)	$\frac{1}{64}$	B1	
(d)	$\frac{1}{3}$	B2	
	TOTAL	**5**	

Question 7

(a)	$a = 3$	B1	
(b)(i)	$y = 3x - 6$ $x = \frac{y+6}{3}$ $f^{-1}(x) = \frac{x+6}{3}$	M1 A1	
(ii)	Straight line passing through (3, 3) and (0, 2)	B1 B1	B2ft their inverse plotted correctly
(c)	Point where lines intersect	B1	
	TOTAL	**6**	

Question 8

(a)	Straight line passing through the origin	B1 B1	
(b)	$a = 0$ or (0, 0)	B1	
	TOTAL	**3**	

Question 9

(a)	x	0	1	2	3	B1	Both values in table correct
	$g(x)=x^2$	0	1	4	9		
	$g^{-1}(x) = \sqrt{x}$	0	1	1.41	1.73		
(b)	Points plotted correctly					B1√	Condone points not joined to give line
(c)	$x = 0,\ x = 1$					B1 B1	
	TOTAL					**4**	
	TOTAL MARK FOR PAPER					**50**	