GCSE 2005
March Series

ASSESSMENT and QUALIFICATIONS ALLIANCE

Mark Scheme

Mathematics B (3302)
Module 3 Tier H

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.

Further copies of this Mark Scheme are available to download from the AQA Website: www.aqa.org.uk

Set and published by the Assessment and Qualifications Alliance.

The Assessment and Qualifications Alliance (AQA) is a company limited by guarantee registered in England and Wales 3644723 and a registered charity number 1073334. Registered address AQA, Devas Street, Manchester. M15 6EX. *Dr Michael Cresswell Director General*

The following abbreviations are used on the mark scheme:

M	Method marks awarded for a correct method.
A	Accuracy marks awarded when following on from a correct method. It is not necessary always to see the method. This can be implied.
B	Marks awarded independent of method.
M dep	A method mark which is dependent on a previous method mark being awarded.
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
SC	Special Case. Marks awarded for a common misinterpretation which has some mathematical worth.
oe	Or equivalent.
eeoo	Each error or omission.

MODULE 3 HIGHER TIER 33003H

1(a)	23.0055…	B1	
(b)	23.0	B1 ft	

2	Increase = 0.70 (or 70p)	B1	
	Percentage increase = $\frac{0.70}{3.20} \times 100$	M1	
	21.875	A1	Accept 21.9 or 22 or 21.88

3(a)	2×54 or 3×36	M1	
	$2 \times 2 \times 3 \times 3 \times 3$	A1	
	$2^2 \times 3^3$	A1	
(b)	$2^3 \times 3^2$	B1	
	HCF = 36 or $2^2 \times 3^2$	B1	SC1 for 6, 12 or 18

4	160 000 000 ÷ 365	M1	Condone 160 million ÷ 365
	438 356**.** …	A1	
	$4.38\ldots \times 10^5$	A1	Accept 4.4×10^5

5	120 ~ 80%	M1	
	Number was $100 \times \frac{120}{80}$	M1	
	150	A1	

6	One of three consecutive numbers is divisible by 3	B1	
	One of two consecutive numbers is divisible by 2	B1	Note: **must** have statement "Product is divisible by 6" to gain 2nd B1
	∴ Product is divisible by 6		SC1 for 2 numerical examples

33003H

7(a)	$V \propto h^3$ or $V = kh^3$	M1	
	$500 = k \times 10^3$	M1	
	$V = \frac{1}{2}h^3$ or $2V = h^3$	A1	Accept $k = 0.5$
(b)	13 500	B1	
(c)	$5000 = \frac{1}{2}h^3$	M1	
	$h^3 = 10\ 000$		
	$h = \sqrt[3]{10000}$	M1	
	$= 21.5\ldots$	A1	

8	$\frac{18\sqrt{2}}{2}$	M1	
	$9\sqrt{2}$	A1	Ignore subsequent working if not contradicting answer; $\sqrt{162}$ M1

9	Min contents = 3.5	B1	
	Max price = £82.49	B1	Accept £82.50
	Max cost = $\frac{82.49}{3.5}$	M1	Needs bounds: $P_{max} \div C_{min}$ $80 < P_{min} \leq 85$ $3.5 \leq C_{max} < 4$ Accept $\frac{82.50}{3.5}$, or $\frac{70.20}{3.5}$ or $\frac{70.21}{3.5}$
	$=$ £23.568…	A1	
	$=$ £23.57	A1	or £20.06

10	Difference is 2 parts	B1	or parts are 27 and 45 B1
	Difference is $\frac{2}{8} \times 72$	M1	Difference is 45 – 27 M1
	18	A1	18 A1
			SC1 9

11(a)	1.34358	B1	
(b)	4570	B1	

33003H

12(a)	–1, 0, 3, 8	B2	–1 eeoo
(b)	Plot points	B1 ft	
	Draw smooth curve	B1 ft	
(c)	$y = x - 3$ or $y = x + 3$ or $y = 3 - x$	M1	Draw or state equation
	Line drawn accurately	A1	
	$x = 2,\ 3$	A1	SC2 No graphical solution

13(a)	12.9×10^5	M1	
	1.29×10^6	A1	SC1 for 1 290 000 or 1.3×10^6
(b)	6.4×10^3	B2	B1 for $10^8 \times 10^{-5} = 10^3$ SC1 for 6400

14	New price (each dress) = 0.7 of old dress or 1.6 of old price	B1	If 100 dresses at £100 B1 for 160 dresses or £70
	New takings = 1.6 × 0.7 of old takings	M1	M1 for 160 × 70 etc
	= 1.12 of old takings	A1	
	12% increase	A1	SC1 70 and 160

15(a)	$7 \times \frac{1}{9}$	M2	M1 for 7 M1 for $\frac{1}{9}$
	$\frac{7}{9}$	A1	
(b)	3^2 or $729^{\frac{1}{3}}$	M1	$\sqrt[3]{27} = 3$ gets M1
	9	A1	

16(a)	$\frac{4}{9}$	B1	oe
(b)	$\frac{6}{10} + \frac{39}{990}$	M1	$1000x =$ $10x =$ $990x =$ M1
	$= \frac{594+39}{990} \quad \left(= \frac{633}{990}\right)$	A1	$639.\dot{3}\dot{9}$ $6.\dot{3}\dot{9}$ 633 A1
	$= \frac{211}{330}$	A1	

33003H

17	$\sqrt{75} - \sqrt{48} = 5\sqrt{3} - 4\sqrt{3}$	B1	Either, $5\sqrt{3}$ or $4\sqrt{3}$, or $\sqrt{12} = 2\sqrt{3}$
	$= \sqrt{3}$	B1	or $\sqrt{12}(\sqrt{75} - \sqrt{48})$ $= \sqrt{900} - \sqrt{576}$ B1
	$\sqrt{12}(\sqrt{75} - \sqrt{48}) = \sqrt{36} = 6$	B1 dep	$= 30 - 24$ B1 $= 6$ B1