AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

General Certificate of Secondary Education

Mathematics 4307
Specification B

Module 3 Tier H 43053H

Mark Scheme

2007 examination - November 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.

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

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　　　　　　　43053H

1(a)	1.126582… or $\frac{89}{79}$	B1	or better
1(b)	1.127	B1 ft	ft if (a) given to at least 4 dp

2	60×1.65　or　$100 \div 1.65$	M1	
	99　　　　or　　60.60…	A1	Allow 60.6, 60.60, 60.61, 60.606 or better
	100 – their 99 or　their 60.60… – 60	M1 dep	May be implied
	England by €1　or　by 60p/61p	A1 ft	Must have correct unit ft to nearest cent or penny rounded or truncated

3	0.39×800 (= 312)	M1	oe　or sight of 0.61　or　61%
	800 – (their 312)	M1 dep	oe　800×0.61
	488	A1	

4(a)	Actual increase is 1900 – 600	M1	1.9 – 0.6　　　　$\frac{1900}{600} \times 100$
	their $\frac{1300}{600} \times 100$	M1 dep	their $\frac{1.3}{0.6} \times 100$　　　their 316.(6)-100
	216.(6…)	A1	Accept 217,　220
	200	B1 ft	ft any number $\geq$ 2 sf
4(b)	1.12×600	M1	672
	0.9×1300	M1	1170
	their 672 + their 1170	M1 dep	Dependent on both M1s
	1842	A1	SC3　2382

5	Any of 1, 2, 3, 4, 6, 9, 12, 18, 36 **and** 36 or　　4 **and** 18 or　12 **and** 18 or　　4 **and** 9 or　　9 **and** 12	B2	A pair of factors of 36 which have a different LCM　　B1 eg　4 and 12, 6 and 6

6(a)	$5(2x + 3)$	B1	
6(b)	$y(y - 2)$	B1	
6(c)	$6x - 8$	B1	

7	Largest = 82 000	B1	oe
	Smallest = 3×10^{-2}	B1	0.03 oe

8	Even $\times$ odd = even **or** odd $\times$ even = even	B1	
	Even $\times$ odd = even **and** odd $\times$ even = even	B1	SC1 at least two correct examples shown with clear evidence of $\times$

9	After 1 day = 64% left After 2 days = 0.64 $\times$ 0.64 (= 0.4096) left	M1	Accept use of amount eg 0.64 $\times$ 1000 (= 640) their 640 $\times$ 0.64 (= 409.6) for M1
	$\times$ 0.64 3 more times = 0.107…	A1	0.64^5 = 0.107… M1A1
	No with either 10.7…% or 89.2…% seen	A1	

10	$\times$ by $\dfrac{\sqrt{6}}{\sqrt{6}}$	B1	Sight of $\dfrac{18\sqrt{6}}{\sqrt{6}\sqrt{6}}$ oe
	Sight of denominator of 6	B1	Remember answer was given, must convince SC1 $3\sqrt{6} \times \sqrt{6}$ = 18 Allow $\dfrac{18\sqrt{6}}{6}$ for B2

11	Sight of 8.5 or 9.5 or 7500 or 8500	B1	or 0.905 or 90.5 Accept $9.4\dot{9}$ for 9.5 and 8499 (.99) for 8500
	Chooses their max price and their max reduction	M1	Max price > 8000 Max reduction >9 or >0.09 or <0.91 or <91 Sensible value
	$\dfrac{8500}{0.905}$ or $\dfrac{8500}{90.5} \times 100$	M1	oe
	£9392.27 or £9392(.00)	A1	Sight of 9392.265(1…) SC3

12(a)	$\dfrac{6}{10}$	B2	oe fraction $\dfrac{4}{10}$ B1
	3×50 or 6×50	M1	Also allow 4×50 for M1 if $\dfrac{4}{10}$ above
	Men = 150	A1	
	Children = 300	A1	
12(b)	3 : 1	B1	oe eg 150 : 50 or $\dfrac{3}{10} : \dfrac{1}{10}$

13(a)	$1\dfrac{2}{3} \times 2$	M1	$3\dfrac{1}{3}$ or $\dfrac{10}{3}$ or $2\dfrac{4}{3}$ oe Allow decimals ≥ 2 dp rounded or truncated $2 + 2 = 4$ or $2 \times 2 = 4$ M0A0
	4	A1	
13(b)	$1\dfrac{2}{3} + 1\dfrac{1}{4}$	M1	
	$(1)\dfrac{8}{12} \ (+) \ (1)\dfrac{3}{12}$	M1	oe Valid denominator, at least one correct numerator $(1).66 \ (+) \ (1).25$
	$2\dfrac{11}{12}$ and some indication of yes	A1	2.91 or 2.92 and Yes oe

14(a)	Attempts to multiply numerators and denominators	M1	
	$\dfrac{6}{55}$	A1	oe
14(b)	Shows intention to times by $\dfrac{1}{4}$	M1	oe $0.375 \div 4$ $3 \div 32$
	$\dfrac{3}{32}$	A1	0.09375

15(a)	16 $(\times)$ 9	M1	Must have both
	144	A1	
15(b)	Correct method for 32 in index form $(= 2^5)$	M1	or lists factors of 32 and 144 with no more than 2 errors
	16 or 2^4	A1	

16	All three correct Statement 1 matches Table B Statement 2 matches Table C Statement 3 matches Table A	B2	B1 for one (or two) correct

17(a)	x coordinate 0.5	B1	Tolerance 0.1
	y coordinate –12.25	B1	Tolerance 0.2
17(b) (i)	$(x - 4)(x + 3)$	B2	B1 $(x + a)(x + b)$ where $ab = \pm 12$
17(b) (ii)	Cancels $(x + 3)$	M1	or multiply $(x^2 - x - 12)(x - 5)$ to give $x^3 - 5x^2 - x^2 - 12x - 5x + 60$ Allow one sign error **and** $(x^2 - 9x + 20)(x + 3)$ to give same Allow one sign error
	Convincing expansion of $(x - 4)(x - 5)$	A1	Must see 4 terms at one point or an explanation of the simplifying

18	Correct method for recurring decimal	M1	eg let $x = 0.\dot{2}$ then $10x = 2.\dot{2}$ and subtract so $9x = 2$ etc
	$\frac{2}{9} \times \frac{9}{20}$ attempted	M1 dep	oe $\frac{2}{9} \times \frac{45}{100}$ attempted or $0.45 \div 9 \times 2$ attempted or 0.1
	$\frac{1}{10}$	A1	oe fraction

19(a)	$\frac{1}{\sqrt{5^2}}$ or $\left(\frac{1}{\sqrt{5}}\right)^2$ or $\frac{1^2}{\sqrt{5^2}}$ or 5^{-1}	M1	
	$\frac{1}{5}$	A1	oe
19(b)	$\sqrt{5}\sqrt{45} = \sqrt{5 \times 45}$	M1	or $\frac{\sqrt{5} \times \sqrt{45}}{5} = \frac{\sqrt{45}}{\sqrt{5}}$ or $\sqrt{45} = \sqrt{9}\sqrt{5}$
	$\sqrt{225} = 15 \div 5 \ (= 3)$	M1	$\sqrt{9} \ (= 3)$ or $\frac{\sqrt{5}\sqrt{9}\sqrt{5}}{5} = \sqrt{9} \ (= 3)$
	$\sqrt{3}$	A1	Allow $3^{\frac{1}{2}}$