AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

General Certificate of Secondary Education

Mathematics 3302
Specification B

Module 3 Tier I 33003I

Mark Scheme

2005 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.

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   INTERMEDIATE TIER   33003I

1	25	B2	5^2 or 0.04	B1

2	Cost is £$\frac{105}{1.75}$	M1	
	= £60	A1	

3	Cost of lettuces is £1.80	B1	Accept 1.8, £1.8 or 180
	Tomatoes cost £2.92 – £1.80	M1	or £2.92 – their £1.80 (not 180 or 60) Must be consistent units
	= £1.12		
	Cost is $\frac{£1.12}{1.75}$	M1 dep	or their $\frac{£1.12}{1.75}$
	= 64p	A1	

4	Time is $\frac{120}{50}$	M1	
	= 2.4 (hours)	A1	
	0.4 hours = 0.4 × 60 minutes	M1	
	2 hours 24 minutes	A1	2 hours 40 minutes 2 hours 4 minutes SC2 144 minutes SC3

5	eg 73 $\Rightarrow$ 7300	B1	
	Add 73 = 7373		
	101 × 73 = 7373	B1	B1 for either 1st or 3rd line B2 for all 3 lines

6	Shares are $\frac{1}{5}$ × 35	M1	Either $\frac{1}{5}$ × 35 or $\frac{4}{5}$ × 35
	= 7 and 28	A1	Both
	Difference is 21	A1	or difference is 3 shares B1 Difference is $\frac{3}{5}$ × 35 M1 which is 21 A1

7(a)	i) 1.7583799...	B1	Accept 1.75838(0) and 1.75837
7(a)	ii) 1.76	B1 ft	
7(b)	390 625	B1	Condone 390,625 and 390.625
	3.90625×10^5	B1 ft	ft at least 5 digits Accept 3.91×10^5 or 3.906×10^5 or 3.9×10^5 [or 3.90×10^5] or 3.9062×10^5 or 3.9063×10^5 (all for 2 marks)

8(a)	Increase is 7.2 kg	B1	M1 $\frac{10.9}{3.7} \times 100$ and subtract 100
	Percentage increase is $\frac{7.2}{3.7} \times 100$	M1	B1 = 295 [–100]
	= 195%	A1	Accept 194.6, 194.59... 190 SC2 194 SC2 1.95 $\Rightarrow$ B1
8(b)	(Minimum) 59.5 kg	B1	

9	In 2001, number is 70 000 × 1.06 = 74 200		
	In 2002, number is 74 200 × 1.06 = 78 652	M1	
	In 2003, number is 78 652 × 1.06 = 83 371		
	In 2004, number is 83 371 × 1.06 = 88 373		
	In 2005, number is 88 373 × 1.06	M1	M2 for $70\,000 \times 1.06^5$
	= 93 676	A1	Accept 93675 or 93675**.** ...
	= 94 000	A1	Accept 93 700, 93 600 Accept 90 000 if 93676 or 93 700 seen Note: 91000 No marks

10	$3140 \approx 0.8\%$	B1	or $3140 \approx 0.008$ Not for $3140 \approx 0.8$
	Area = $\frac{3140}{0.8} \times 100$	M1	Area = $\frac{3140}{0.008}$
	= 392 500	A1	= 392 500
			SC2 Misplaced point

11	Cost is $\dfrac{£6}{30}$	M1	or $\dfrac{600}{30}$
	= 0.2 or 20	A1	
	= 20 pence	B1	or £0.20 [not £0.2] SC2 for £0.2 Not for £20 or 0.2 pence

12	Large is 3 times small pack	M1	or small is $\dfrac{1}{3}$ times large pack
	3 × £3.20 = £9.60		£10.20 ÷ 3 = £3.40
			or Price per glass small 80p [or £0.80] large 85p [or £0.85] M1 both answers needed correct
	Small pack is better value	A1	

13	Number of hours worked is $4\dfrac{1}{2}$ × 6 = 27	B1	or £10 × 4.5 = £45 or £10 × 6 = £60
	Pay is 27 × £10	M1	45 × 6 $\qquad\qquad$ 60 × $4\dfrac{1}{2}$
	= £270	A1	= £270

14(a)	First number is divided by 10 and the other is multiplied by 10	B1	or vice versa Accept move decimal point one place to the left and the other decimal point one place to the right
14(b)	1.30284	B1	

15(a)	Discount is £42 × $\dfrac{1}{6}$	M1	
	= £7	A1	
	Price is £35	A1	or £42 × $\dfrac{5}{6}$ M1 = £35 A2
15(b)	Discount is $\dfrac{20}{100}$ × £42	M1	or 10% = £4.20; 20% is £4.20 + £4.20 M1 [needs £4.20]
	= £8.40	A1	
	Price is £33.60	A1	or $\dfrac{80}{100}$ × £42 M1A1 = £33.60 A1

16(a)	$\dfrac{21}{24} - \dfrac{8}{24}$	M1	At least one correct and denominator 24 [or multiple of 24]
	$= \dfrac{13}{24}$	A1	oe
16(b)	$\approx \dfrac{400 \times 3}{0.6}$	M1	At least two suitable [accept 390] Do not accept 1 or 0.5 for 0.6
	$= \dfrac{1200}{0.6}$	A1	Needs $\dfrac{1200}{0.6}$ or equivalent [or $\dfrac{1170}{0.6}$]
	$= 2000$ [Note: no working 0 marks]	A1	[or 1950] [Check not from $\dfrac{400 \times 5}{1}$]
16(c)	2.4×10^{-6}	B1	
16(d)	14	B1	(and −14) (not just −14)

17(a)	2×30 or 3×20	M1	First prime factor correct
	$= 2 (\times) 2 (\times) 3 (\times) 5$	A1	Condone $\times$ 1
	$= 2^2 \times 3 \times 5$	A1	
17(b)	$24 = 2^3 \times 3$	M1	
	HCF is 12 or $2^2 \times 3$ or $2 \times 2 \times 3$	A1	SC1 4 or 6

18(a)	11.5×10^{12}	B1	or correct answer, not in correct standard form, could be normal numbers
	$= 1.15 \times 10^{13}$	B1	
18(b)	0.46×10^{-2}	B1	B1 for digits 46
	4.6×10^{-3}	B1	