



General Certificate of Secondary Education

Mathematics 3302 *Specification B*

Module 3 Intermediate Tier

Mark Scheme

2006 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 awarded.	A method mark which is dependent on a previous method mark being awarded.
ft an	Follow through marks. Marks awarded for correct working following a mistake in 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

Q	Answers	Mark	Comments
1(a)	8	B1	
1(b)	$(15 - 6) \times 2$	B1	>1 bracket allowed if still correct
2(a)	0.05×1055	M1	$10\% = 1055 \div 10$ (=105.5) and $(105.5) \div 2$
	52.75	A1	Do not accept 53 unless 52.75 seen
2(b)	55	B1ft	ft from any value in (a) that is not a multiple of £5
3(a)	$\frac{3}{4} \times 660$	M1	$660 - \frac{1}{4} \times 660$
	495	A1	
3(b)	$660 \div (2 + 3 + 7)$ (= 55)	M1	Only allow $2 + 3 + 7 = 11$ or 12 or 13
	their 55×7	M1dep	$\frac{7}{12} \times 660$ is M2
	385	A1	>1 answer given is A0
4	25×1.76 (= 44) or 25×1.75 (= 43.75)	M1	$8 \div 1.76$ (= 4.5...) or $8 \div 1.75$ (= 4.5... or 4.6)
	their 44 or $43.75 \div 8$	M1dep	$25 \div$ their 4.5... or 4.6
	Answer in range 5.4 to 5.6 inclusive	A1	
5	Chooses to square any number between 0 and 1 exclusive	M1	eg, 0.5^2 0.2×0.2 $\left(\frac{1}{4}\right)^2$
	Evaluates correctly (conclusion can be implied)	A1	Ignore any squaring of numbers that are not between 0 and 1 exclusive even if they mistakenly give a correct conclusion eg, ignore $-2 \times -2 = -4$

Q	Answers	Mark	Comments
6(a)	256	B1	
6(b)	1.25	B1	oe
6(c)(i)	8.55087(...)	B1	
6(c)(ii)	8.6	B1ft	ft from any (i) > 2 significant figures
7(a)	0.175×80 oe (= 14)	M1	Build up eg, $10(\%) = 80 \div 10 (= 8)$, $5(\%) = (8) \div 2 (= 4)$, $2\frac{1}{2}(\%) = (4) \div 2 (=2)$ and adds
	80 + their 14	M1dep	80×1.175 is M2
	2	A1	Answer of 94 implies M2
7(b)	$75 - 66 (= 9)$	M1	$1 - \frac{66}{75} (=0.12)$ or $\frac{66}{75} \times 100 (=88)$
	$\frac{\text{their } 9}{75} \times 100$	M1dep	their 0.12×100 or $100 - \text{their } 88$
	12	A1	Answer 88 implies M1
7(c)	Sight of 0.4 oe	M1	$40(\%) = 18.6(0)$ M1
	$18.6(0) \div 0.4$	M1dep	$1(\%) = 18.6(0) \div 40 (= 0.465)$ $100(\%) = (0.465) \times 100$ M1dep
	46.50	A1	Do not allow 46.5 but implies M2
8(a)	3.5×10^{-1}	B1	
8(b)	$6.4 \times 10^{15} \div 8 \times 10^9$	M1	
	800 000	A1	oe eg, 0.8×10^6 Note: Correct embedded answers in a multiplication are acceptable eg, $8 \times 10^9 \times 800\,000$ M1 A1 A0 $8 \times 10^9 \times 8 \times 10^5$ M1 A1 A0
	8×10^5	A1	

Q	Answers	Mark	Comments
9(a)	3	B1	
9(b)	200	B2	25 or 8 seen is B1
9(c)	$\left(\frac{7}{8}\right) - \frac{4}{8}$	M1	If a different but appropriate common denominator is used at least one numerator must be correct on converting the two fractions. Allow 0.875 – 0.5 No % unless recovered
	$\frac{3}{8}$	A1	oe fraction Allow 0.375
10	Converts 0.4 and $\frac{9}{20}$ to % or Converts $\frac{9}{20}$ and 35% to decimal or Converts to fractions with a common denominator	B1, B1	40(%) and 45(%) B1 for each 0.45 and 0.35 B1 for each eg, $\frac{40}{100}$ and $\frac{45}{100}$ and $\frac{35}{100}$ B1 for 2 correct B2 for 3 correct Overall no more than 2 marks can be awarded here
	Order $\frac{9}{20}$ 0.4 35%	B1dep	Dependent on both B1s SC1 Order correct with no valid working

Q	Answers	Mark	Comments
11(a)	$\frac{300}{500} \times 100$	M1	Build up eg, 10(%) = $500 \div 10$ (=50) and $300 \div (50) \times 10$ or 20(%) = $500 \div 5$ (=100) and $300 \div (100) \times 20$ or 50(%) = 250 and 10(%) = 50 and 50 + 10
	60	A1	
11(b)	250	B1	
11(c)	$140 + \frac{1}{2} \times 140$	M1	$\frac{750}{500} \times 140$
	210	A1	
12	$\frac{10}{100} \times (16.50 + 8.50)$ (= 2.50)	M1	$\frac{10}{100} \times 16.50$ (= 1.65) and $\frac{10}{100} \times 8.50$ (= 0.85) worked out separately
	$(16.50 + 8.50) - \text{their } 2.5(0)$	M1dep	16.50 – their 1.65 (= 14.85) and 8.50 – their 0.85 (= 7.65) $\frac{90}{100} \times (16.50 + 8.50)$ is M2 or $\frac{90}{100}$ of each worked out separately is M2
	22.50	A1	Do not accept 22.5 but M2 implied SC1 Answer 14.85 or 7.65

Q	Answers	Mark	Comments
13	$\frac{8 \times 500}{0.5} (= \frac{4000}{0.5})$ or $\frac{8 \times 503}{0.5} (= \frac{4024}{0.5})$	B2	B1 for any two values correct
	8 000 or 8048 SC1 Either answer with no working	B1	Allow B1 for $\frac{10 \times 500(\text{or } 503)}{0.5}$ or $\frac{8 \times 500(\text{or } 503)}{0.4}$ and B1 for 10000 (or 10060)
14(a)	24.50	B1	
14(b)	25.49	B1	
15(a)(i)	2 (and) 75 or 3 (and) 50 or 5 (and) 30	M1	Do not allow for a list of factors even in pairs
	$2 (\times) 3 (\times) 5 (\times) 5$	A1	Condone factor of 1
	$2 \times 3 \times 5^2$	A1	Must have \times signs Do not allow factor of 1
15(a)(ii)	$3 (\times) 5 (\times) 5$	M1	Selects all common factors from $3^2 \times 5^2$ and their (a)(i)
	75	A1	SC1 Answer 15 or 25
15(b)	12	B2	B1 for any other common multiple (any other multiple of 12)

Q	Answers	Mark	Comments
16(a)	South Africa	B1	Accept 1.22×10^6 Accept unambiguous indication on the chart
16(b)	Converts 4.47×10^5 or 11300 to a form where subtraction could be completed without a calculator	M1	eg, 4.47×10^5 to normal form (allow errors with zeros but do not accept 4.4700000 or digits 2235) eg, 11300 to $a \times 10^5$ (allow errors with position of decimal point but a must be $< 11\ 300$)
	447 000 (– 11 300)	A1	
	435 700 or 436 000	A1	oe