ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Mathematics 4302
Specification B

Module 3 Tier H 43003H

Two-Tier Practice Paper

Mark Scheme

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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 43003H

1(a)	shows a correct method for finding 17.5% of 76	M1	$\frac{17.5}{100} \times 76$ build up method must be complete
	(£)13.3(0)	A1	
	total with VAT = £89.30	A1	ft if M1 awarded 76×1.175
1(b)	$(15 / 40) \times 100$	M1	oe
	37.5	A1	oe

2	$5 \div 34$ or $500 \div 34$	M1	oe may be implied by 14…. or 0.14… or build up to 13, 14 or 15 cartons
	10 or $1000 \div 34$	M1	oe 29…or 0.29
	get 14 and 29	A1	

3	1.9692307	B1	
	2.0	B1	ft for answer greater than 1 decimal place above

4(a)	400 x 1.04 (=416)	M1	oe 448 as answer can imply this M1
	(416) x 1.04 (=432.64) and (432.64) x 1.04 = (449.9456)	M1	400×1.04^3 M2 49.945(6) implies M2
	shows 449.945(6)	A1	must see at least 3dp (449.945 or 449.946) (ag) not necessary to state rounding

4(b)	449.95 – 400.00 = 49.95	M1	$\frac{449.95}{400} \times 100$
	(49.95 / 400) x 100	M1dep	$\frac{449.95}{400} \times 100$ - 100
	12.4875 (or 12.5, 12.48, 12.49, 12.487, 12.488)	A1	

5	728.5	B1	

6(a)	$(2.2 \times 10^7) \times (8.2 \times 10^4)$	B1	oe do not accept words
	$1.8(04) \times 10^{12}$	B1ft	1.8^{12} scores B1 B0
6(b)	$[(7.7 \times 10^3) / (2.2 \times 10^7)]$ (x100)	M1	oe allow words
	0.035	A1	3.5^{-2} implies M1 A1
	3.5×10^{-2}	B1ft	ft answers < 1 sc1 digits 35

7(a)	missing values 20, 80, 320, 500	B2	B1 for 2 or 3 correct
7(b)	shows that 800 is possible from 80 + 720 (or 2 and 6)	B1	oe do not accept 800 is a multiple of 20
	shows that 820 is possible from 320 + 500 (or 4 and 5)	B1	oe do not accept 820 is a multiple of 20
	concludes that 810 cannot be achieved by adding 2 values	B1	e.g cannot get £810 from tables cannot get £810 from these values or 810 ÷ 20 = 40.5 810 is not a multiple of 20

8	1.995 or 2.005 (litres) or 1995 or 2005 (millilitres) seen	B1	or $2004.\dot{9}$ not e.g 2004.99
	207.5 or 212.5 (millilitres) or 0.2075 or 0.2125 (litres) seen	B1	
	attempts their max / their min	M1	must be a 'max' and a 'min'
	$\frac{10 \times 2005}{207.5}$	A1	(= 96.6(265)…) $\frac{10 \times 2.005}{0.2075}$
	96	A1	

9(a)	1 372 000	B1	
9(b)	1.372(0…)	B1	

10	shows speed = $\frac{\text{distance}}{\text{time}}$	M1	with any attempt to substitute values
	6 / 1.5	M1	oe (6 / 1.3 gets M1 M0) scaling 2 miles in 30 minutes M2
	4	A1	

11	10% = (£11), so 5% = (£5.50) and £110 – their £5.50	M1	or fully correct build up method
	£104.50	A1	

12	intention to add $\frac{1}{2}$ *and* $\frac{1}{3}$	M1	oe may be implied by 5/6, 10/12 etc any diagrams must be supported by arithmetic
	multiplies their 5/6 by 7	M1	$\frac{35}{6}$ or $5\frac{5}{6}$ implies M2
	6	A1	
12 Alt	attempts to find total for one dog	M1	may be implied by $3\frac{1}{2}$ or $2\frac{1}{3}$
	attempts to find total for both dogs and attempting to add	M1	$\frac{35}{6}$ or $5\frac{5}{6}$ implies M2
	6	A1	

13(a) (i)	$2^4 \times 3$	B1	either order
13(a) (ii)	$2^4 \times 3 \times 5$	B1	any order both correct in non index form B0 B1
13(b)	$32 = 2^5$	M1	may be seen in (c) if (b) blank or lists sufficient multiples of both numbers correctly (24,) 48, 72, 96 and (32,) 64, 96
	$2^5 \times 3$ or 96	A1	
13(c)	8	B1	sc1 for 16(b) and 16(c) reversed

14	5/2	B1	oe

15	1/3 and 5/7	B1 B1	if nothing on answer line accept any indication e.g ringed

16(a)	$250 \times (0.8)^2$ or $0.2 \times 250 = (50)$ $250 - (50) = (200)$ $0.2 \times (200) = (40)$ $(200) - (40) = (160)$	M1	oe
	160	A1	
16(b)	$250 \times (0.8)^3$ or $(160) \times (0.8)$ or $0.2 \times (160) = (32)$ $(160) - (32) = (128)$	M1	M2 $250 \times (0.8)^4$
	$\times 0.8$ or $0.2 \times (128) = (25.6)$ $(128) - (25.6) = (102.4)$	M1dep	
	102.4	A1	

17(a)	-1.7	B1	+/- 0.05 inclusive ignore positive solutions
17(b)	attempts to subtract 2 quadratics either order	M1	
	$2x + 1$ or $-y = -2x - 1$	A1	no working but correct line on graph implies M1A1
	-1.4 and 1.9	A1	both within 0.1

18(a)	$pq = \sqrt{36}$ **or** $(pq)^{-1} = 1/pq$	M1	
	1/6	A1	allow +/-
18(b)	$\sqrt{6}\sqrt{6} - \sqrt{3}\sqrt{6} - \sqrt{3}\sqrt{6} + \sqrt{3}\sqrt{3}$	M1	at least 3 terms correct $(6 - 2\sqrt{3}\sqrt{6} + 3)$
	shows that $(2)\sqrt{3}\sqrt{6} = (2)\sqrt{18}$ or $(2)3\sqrt{2}$	M1	not dependent upon 1st M1
	convincingly shows that answer is as required	A1	ag must see 6, 3 and $3\sqrt{2}$