Practice Test 1H (Set 10) – Higher tier mark scheme

Question		Working	Answer	Mark	Notes
1	(a)		5 700 000	1	B1
	(b)		4×10^{-3}	1	B1
	(c)		5 000 000 **or** 5×10^{6} oe	2	B2 If not B2 then award B1 for 320000 or 3.2×10^{5} oe or 5×10^{n} oe where $n \neq 6$
					Total 4 marks

Question		Working	Answer	Mark	Notes
2	(a)		9, 3, (−1), −3, (−3), −1, (3)	2	B2 If not B2 then award B1 for at least 2 correct values
	(b)			2	M1 dep on B1 ft from (a) for at least 5 points plotted correctly
			correct graph		A1 for the correct graph (clear intention to go through all the points and which must be curved at the bottom)
					Total 4 marks

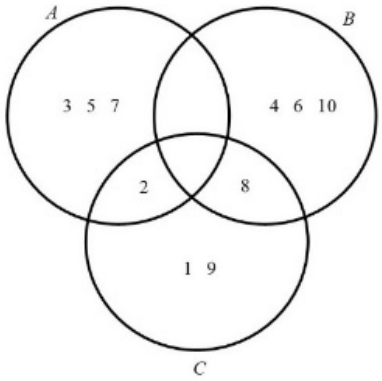
Question		Working	Answer		Mark	Notes
3	(a)		e^4	1	B1	
	(b)		y^{16}	1	B1	
	(c)	$x^2 + 9x - 2x - 18$		2	M1	for 3 correct terms **or** 4 correct terms ignoring signs **or** $x^2 + 7x +$ c **or** .... $+ 7x - 18$
			$x^2 + 7x - 18$		A1	
	(d)		$4cp^2(4c^3 + 5p)$	2	B2	if not B2 then award B1 for any correct factorisation with at least 2 factors outside the bracket eg $4cp(4c^3p + 5p^2)$, $cp^2(16c^3 + 20p)$, $2p(8pc^4 + 10cp^2)$ etc **or** the correct common factor **and** a 2 term expression with just one error
						Total 6 marks

Practice Test 1H (Set 10) – Higher tier mark scheme

Question		Working	Answer	Mark	Notes
4		e.g. $\frac{14}{3}$ **and** $\frac{10}{9}$		3	M1 Both fractions expressed as improper fractions
		e.g. $\frac{14}{3} \times \frac{9}{10}$			M1 **or** for both fractions expressed as equivalent fractions with denominators that are a common multiple of 3 and 9 eg. $\frac{42}{9} \div \frac{10}{9}$ **or** $\frac{126}{27} \prod \frac{30}{27}$
		e.g. $\frac{14}{3} \times \frac{9}{10} = \frac{126}{30} = \frac{21}{5} = 4\frac{1}{5}$ **or** $\frac{14}{3} \times \frac{9}{10} = \frac{126}{30} = 4\frac{6}{30} = 4\frac{1}{5}$ **or** $\frac{\cancel{14}^{7}}{\cancel{3}^{1}} \times \frac{\cancel{9}^{3}}{\cancel{10}^{5}} = \frac{21}{5} = 4\frac{1}{5}$ **or** $\frac{126}{27} \prod \frac{30}{27} = \frac{126}{30} = \frac{21}{5} = 4\frac{1}{5}$	Shown		A1 Dep on M2 for conclusion to $4\frac{1}{5}$ from correct working – either sight of the result of the multiplication e.g. $\frac{126}{30}$ must be seen or correct cancelling prior to the multiplication to $\frac{21}{5}$ NB: use of decimals scores no marks
					Total 3 marks

Question		Working	Answer	Mark	Notes
5	(a)		$\frac{6}{14}, \frac{8}{14}$	2	B1 for $\frac{6}{14}\left(\frac{3}{7}\right), \frac{8}{14}\left(\frac{4}{7}\right)$ in correct positions. Allow decimals of 2dp or better (0.43, 0.57)
			$\frac{3}{10}, \frac{7}{10}, \frac{3}{10}, \frac{7}{10}$		B1oe for $\frac{3}{10}, \frac{7}{10}, \frac{3}{10}, \frac{7}{10}$ in correct positions.
	(b)	$\frac{8}{14} \times \frac{7}{10}$		2	M1 ft from (a)
			$\frac{2}{5}$ oe		A1
	(c)	$\frac{7}{13} \times \frac{6}{9}\left(= \frac{42}{117} = \frac{14}{39} = 0.35(897...)\right)$ **or** $\frac{8}{14} \times \frac{7}{13}\left(= \frac{56}{182} \text{oe}\right)$ **or** $\frac{7}{10} \times \frac{6}{9}\left(= \frac{42}{90}\right)$		3	M1 ft from (a) ($\frac{7}{13} = 0.54$ to 2dp $\frac{6}{9} = 0.67$ to 2dp)
		"$\frac{42}{117}$"×"$\frac{2}{5}$" or $\left(\frac{8}{14} \times \frac{7}{13}\right) \times \left(\frac{7}{10} \times \frac{6}{9}\right)$			M1 ft from (b)
			$\frac{28}{195}$ oe		A1 for $\frac{28}{195}$ oe, e.g. 0.14(3589…) from accurate working
					Total 7 marks

Question		Working	Answer	Mark	Notes
6		Two pairs of intersecting arcs with equal radius centre D and E			M1 for 2 pairs of arcs that intersect within guidelines **or** correct perpendicular bisector without arcs.
			Correct bisector with arcs	2	A1
					Total 2 marks

Question		Working	Answer	Mark	Notes
7	(a)	**Examples** There are no members that are in both *A* and *B* No members in common (in *A* and *B*) No numbers the same (in *A* and *B*) *B* has even numbers. *A* has odd numbers except 2 which is not in *B* Nothing in *A* is in *B* oe No overlap A and B don't share any numbers	Correct statement	1	B1 for a statement which indicates correct meanings for intersection and empty set
	(b)		1 and 9	1	B1
	(c)	e.g.  	1, 2, 8, 9	2	B2 for fully correct (B1 for 3 or 4 correct with no more than one addition or a fully correct Venn diagram)
					Total 4 marks

Question		Working	Answer	Mark	Notes
8		$0.5 \times 6 \times 6$ (=18)		5	M1 For area of triangle, or may use $\frac{1}{2} \times 6 \times 6\sqrt{2} \sin 45$ or $\frac{1}{2} \times 6\sqrt{2} \times 3\sqrt{2}$ oe
		$(d^2 =)\ 6^2 + 6^2$ (=72) or $\frac{AC}{(\sin 90)} = \frac{6}{\sin 45}$			M1
		$\sqrt{6^2 + 6^2}$ ($= \sqrt{72} = 6\sqrt{2}$ =8.4(85…)or 8.5) **or** $AC = \frac{6(\sin 90)}{\sin 45} = 6\sqrt{2}$ =8.4(85...)or 8.5) oe			M1
		$0.5 \times \pi \times \left(\frac{"8.48.."}{2}\right)^2$ (= 9π or 28….)			M1
			46.3		A1 for 46.2 – 46.3
					Total 5 marks

Question		Working	Answer	Mark	Notes
9		15 ÷ 20 (=0.75) 48 ÷ 15 (=3.2) 21 ÷ 5 (=4.2) 16 ÷ 10 (=1.6)	correct histogram	3	B3 For a fully correct histogram [If not B3 then B2 for 3 correct frequency densities (can be implied by heights) or 3 correct bars drawn If not B2 then B1 for 2 correctly calculated frequency densities (can be implied by heights) or 2 correct bars drawn.]
					Total 3 marks

Question		Working	Answer	Mark	Notes
10	(a)		$(2x – 3)(x – 2)$	2	B2 or $(3 – 2x)(2 – x)$ (B1 for $(2x + a)(x + b)$ where $ab = 6$ or $2b + a = -7$ eg $(2x + 3)(x + 2)$, $(2x – 5)(x – 1)$), etc or for
	(b)	$4m + 9 = 3(7 – 2m)$		4	M1 for removing fraction
		$4m + 9 = 21 – 6m$			M1 for correct expansion of bracket in a correct equation
		$4m + 6m = 21 – 9$ **or** $10m = 12$ **or** $-21 + 9 = -6m – 4m$ **or** $-10\text{m} = -12$			M1 for a correct equation with m terms isolated on one side ft their equation if first M1 awarded
			$\frac{12}{10}$ oe		A1 dep on at least M2 [SC: B2 for an answer of $m = 2$ with working shown (from $4m + 9 = 21 – 2m$ oe) **or** $m = -0.2$oe with working shown (from $4m + 9 = 7 – 6m$ oe)]

Question		Working	Answer	Mark	Notes	
11			7, 8, 9, 10, 11	2	B2	completely correct. (B1 for 4 or 5 correct and no more than 1 incorrect **or** for all terms seen correctly placed in a Venn diagram or for a correct description of the numbers in the set but not listed, eg $7 \leq x < 12$)

Question		Working	Answer	Mark	Notes	
12		$2x + 0.18 + 2x + 3x + 0.26 + x = 1$ **or** $1 – (0.18 + 0.26)$ $(= 0.56)$		4	M1	
		$x = (1 – 0.18 – 0.26) \div (2 + 2 + 3 + 1)$ $(=0.07)$			M1	
		eg $(0.18 + 4 \times$"0.07"$) \times 200$ **or** 0.46×200 **or** $36 + 42 + 14$ oe			M1	dep on M2 and probabilities between 0 and 1 **or** $\frac{92}{200}$, oe with 92 seen
			92		A1	
						Total 4 marks

Question		Working	Answer	Mark	Notes
13		$y^2 = \frac{3x-2}{x+1}$			M1 squaring both sides to get a correct equation
		$xy^2 + y^2 = 3x - 2$ oe			M1 for multiplying by the denominator **and** expanding the bracket
		$y^2 + 2 = x(3 - y^2)$ oe			M1 for isolating terms in x **and** factorising the correct expression of the equation
			$x = \frac{2+y^2}{3-y^2}$	4	A1 accept $x = \frac{-2-y^2}{y^2-3}$ oe
					Total 4 marks

Question		Working	Answer	Mark	Notes
14		5.5 or 6.5 or 12.5 or 17.5		3	M1 Accept $6.4\dot{9}$ for 6.5 and $17.4\dot{9}$ for 17.5
		17.5 – 5.5			M1 for UB – LB where $15 < UB \leq 17.5$ and $5.5 \leq LB < 6$
			12		A1 dep on M2
					Total 3 marks

Question		Working	Answer		Mark	Notes
15		$x = 0.25454\ldots$ $100x = 25.454\ldots$ $10x = 2.5454...$ $1000x = 254.54...$		2	M1	For 2 recurring decimals that when subtracted give a whole number or terminating decimal eg 25.2 or 252 etc eg $100x = 25.454\ldots$ and $x = 0.25454...$ **or** $1000x = 254.54...$ and $10x = 2.5454....$ with intention to subtract. (if recurring dots not shown then showing at least the digits 25454, ie 5sf) **or** $0.2 + 0.0\dot{5}\dot{4}$ **and** eg $x = 0.05454..., 100x = 5.4545...$ with intention to subtract.
		eg $100x - x = 25.454... - 0.254... = 25.2$ **and** $\frac{25.2}{99} = \frac{14}{55}$ **or** $1000x - 10x = 254.545... - 2.545... = 252$ **and** $\frac{252}{990} = \frac{14}{55}$ **or** $100x - x = 5.4545... - 0.05454... = 5.4$ **and** $\frac{5.4}{99} = \frac{54}{990}\left(= \frac{3}{55}\right)$ **and** $\frac{2\times 99 + 54}{990} = \frac{252}{990} = \frac{14}{55}$ or $\frac{5.4}{99} = \frac{54}{990} = \frac{3}{55}$ and $\frac{11+3}{55} = \frac{14}{55}$	show		A1	for completion to $\frac{14}{55}$
						Total 2 marks

Question		Working	Answer	Mark	Notes
16		$\frac{4+\sqrt{8}}{\sqrt{2}-1}\times\frac{\left(\sqrt{2}+1\right)}{\left(\sqrt{2}+1\right)}$			M1 for rationalising the denominator by multiplying numerator and denominator by $\sqrt{2}+1$ (or $-\sqrt{2}-1$) condone missing brackets
		e,g, $\frac{4\sqrt{2}+4+\sqrt{8}\sqrt{2}+\sqrt{8}}{2-1}$ **or** $\frac{4\sqrt{2}+4+4+\sqrt{8}}{2-1}$ **or** $\frac{4\sqrt{2}+4+\sqrt{16}+\sqrt{8}}{2-1}$ **or** $= 4\sqrt{2}+4+4+\sqrt{8}$ oe			M1 (dep) for expansion of numerator with at least 3 terms correct oe Using $-\sqrt{2}-1$ e.g. $\frac{-4\sqrt{2}-4-\sqrt{8}\sqrt{2}-\sqrt{8}}{-2+1}$ **or** $\frac{-4\sqrt{2}-4-4-\sqrt{8}}{-2+1}$ **or** $\frac{-4\sqrt{2}-4-\sqrt{16}-\sqrt{8}}{-2+1}$
			$8+6\sqrt{2}$	3	A1 (dep on M2) or for stating $a = 8$ and $b = 6$
					Total 3 marks

Question		Working	Answer		Mark	Notes
17	(a)		correct graph (see end of mark scheme) [must go through (60, 2), (150, 0), (240, −2), (330, 0)] and not through (0, 0)	2	B2	if not B2 then award B1 for a graph of the correct shape going through 2 or 3 of the given points or for a clear stretch of SF2 (ie a maximum point on graph at (x_1, 2) and a minimum point at (x_2, −2)) or a clear translation of $\begin{pmatrix}-30\\0\end{pmatrix}$ (ie a point on graph at (150, y) and a point at (330, y))
	(b)(i)		$(x-3)^2+1$	2	B2	(B1 for $(x-\frac{6}{2})^2+n$ (where n ≠ 1) **or** for $(x-m)^2+1$ (where m ≠ 3) **or** for $x^2-ax-ax+a^2+b$ with $2a=6$ or $a^2+b=10$)
	(b)(ii)		translation of $\begin{pmatrix}3\\1\end{pmatrix}$	2	B1	for translation
					B1	For $\begin{pmatrix}3\\1\end{pmatrix}$ ft from (b)(i) must be column vector
						Total 6 marks

Question		Working	Answer	Mark	Notes
18		$x(2x + 5)(3x - 1)$ or $(2x + 5)(3x^2 - x)$ or $(2x + 5)(2x - 5)$ oe			M1 for a correct factorisation of the numerator into 2 or 3 factors where one of the factors must be $(2x + 5)$ **or** denominator into 2 brackets where one of the factors must be $(2x + 5)$
		$x(2x + 5)(3x - 1)$ or $(2x + 5)(3x^2 - x)$ **and** $(2x + 5)(2x - 5)$ oe			M1 for a correct factorisation of the numerator into 2 or 3 factors where one of the factors must be $(2x + 5)$ **and** denominator into 2 brackets where one of the factors must be $(2x + 5)$
			$\frac{x(3x-1)}{2x-5}$	3	A1 accept $\frac{3x^2-x}{2x-5}$ oe Do not ISW
					Total 3 marks

Question		Working	Answer	Mark	Notes
19		$\left(\frac{10+2}{2}, \frac{7+19}{2}\right)$ **or** (6, 13)	5	M1	
		$\frac{19-7}{10-2}\left(=\frac{12}{8}\right)$ oe **or** 1.5 oe		M1	
		$m \times \frac{3}{2} = -1$ oe **or** $m = -\frac{2}{3}$		M1	for use of $m_1m_2 = -1$
		"13" = "$-\frac{2}{3}$" × "6" + c **or** $c = 17$ oe **or** $y - "13" = "-\frac{2}{3}"(x - "6")$		M1	Or for $y = -\frac{2}{3}x + 17$ [NB: "13", "6" and "$-\frac{2}{3}$" must come from correct working]
			$3y + 2x = 51$	A1	for $3y + 2x = 51$ **or** $3y = -2x + 51$ etc but must be integer coefficients
					Total 5 marks

Question		Working	Answer	Mark	Notes
20		(8 =) 2 × 2 × 2 or 2^3 or 2^{3+n}		2	M1 For clearly writing 8 as a product of prime factors or as 2^3
			$2^{n+3} \times 3 \times 5^m$		A1
					Total 2 marks

Question		Working	Answer	Mark	Notes
21	(a)		13	1	B1
	(b)	$y=2\left(x^2-10x\right)+9$ **or** $y=2\left(x^2-10x+\frac{9}{2}\right)$			M1 for a correct equation for a first step in order to complete the square
		e.g. $y=2\left(\left(x-5\right)^2-5^2\right)+9$ **or** $y=2\left(\left(x-5\right)^2-5^2+\frac{9}{2}\right)$ **or** $y=2\left(x-5\right)^2-41$ oe			M1 dep
		$\left(x-5\right)^2=\frac{y+41}{2}$ oe			M1
			$5+\sqrt{\frac{x+41}{2}}$	4	A1 oe
					Total 5 marks
Note: Allow candidates to swap *x* and *y* when finding the inverse					

Practice Test 1H (Set 10) – Higher tier mark scheme

Performance data for Practice Test 1H (Set 10)

				Edexcel averages: scores of candidates who achieved grade:							
	Mean score	**Max score**	**Mean %**	**ALL**	**9**	**8**	**7**	**6**	**5**	**4**	**3**
Q01	1.87	2	94	1.87	1.97	1.96	1.93	1.88	1.82	1.69	1.54
Q02	5.24	6	87	5.24	5.91	5.74	5.46	5.14	4.71	4.13	3.57
Q03	3.41	4	85	3.41	3.88	3.72	3.54	3.34	3.07	2.71	2.34
Q04	2.37	3	79	2.37	2.87	2.70	2.49	2.20	1.93	1.57	1.28
Q05	3.11	4	78	3.11	3.91	3.77	3.50	2.99	2.19	1.30	0.75
Q06	1.55	2	78	1.55	1.87	1.77	1.63	1.49	1.31	1.01	0.76
Q07	2.91	4	73	2.91	3.68	3.41	3.05	2.66	2.23	1.72	1.34
Q08	3.63	5	73	3.63	4.58	4.19	3.89	3.48	2.96	1.99	1.13
Q09	2.00	3	67	2.00	2.84	2.60	2.21	1.66	1.07	0.59	0.31
Q10	5.28	8	66	5.28	7.59	6.63	5.51	4.36	3.21	2.09	1.34
Q11	1.28	2	64	1.28	1.81	1.60	1.37	1.07	0.75	0.51	0.32
Q12	2.54	4	64	2.54	3.68	3.24	2.71	2.14	1.44	0.81	0.30
Q13	2.05	4	51	2.05	3.59	2.73	1.93	1.30	0.81	0.47	0.24
Q14	1.53	3	51	1.53	2.52	2.06	1.57	1.07	0.62	0.29	0.13
Q15	1.01	2	51	1.01	1.78	1.44	1.00	0.57	0.29	0.13	0.06
Q16	1.34	3	45	1.34	2.70	1.98	1.14	0.54	0.22	0.10	0.05
Q17	2.34	6	39	2.34	4.42	3.17	2.13	1.27	0.68	0.36	0.20
Q18	1.00	3	33	1.00	2.31	1.33	0.70	0.33	0.18	0.08	0.06
Q19	1.34	5	27	1.34	3.55	1.58	0.70	0.37	0.22	0.15	0.09
Q20	0.50	2	25	0.50	1.33	0.54	0.24	0.16	0.12	0.10	0.08
Q21	1.22	5	24	1.22	2.15	1.16	1.00	0.93	0.85	0.74	0.62
	47.52	**80**	**59**	**47.52**	**68.94**	**57.32**	**47.70**	**38.95**	**30.68**	**22.54**	**16.51**

Practice Test 1H (Set 10) – Higher tier mark scheme

Suggested grade boundaries

1MA1 Practice Tests (Set 10)			9	8	7	6	5	4	3	2	1
1H	Higher tier	Paper 1H	63	52	43	35	27	20	17		
2H/3H	Higher tier	Paper 2H/3H	60	47	38	30	22	15	11		
Total	**Higher tier**		**123**	**99**	**81**	**65**	**49**	**35**	**28**		

(Marks for papers 1H, 2H/3H are each out of 80.)