

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

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

Question		Working	Answer	Mark	Notes
<b>2</b>	(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)
					<b>Total 4 marks</b>

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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 <b>or</b> 4 correct terms ignoring signs <b>or</b> $x^2 + 7x + c$ <b>or</b> .... + 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 <b>or</b> the correct common factor <b>and</b> a 2 term expression with just one error	
					<b>Total 6 marks</b>

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Question		Working	Answer	Mark	Notes
4		e.g. $\frac{14}{3}$ <b>and</b> $\frac{10}{9}$		3	M1 Both fractions expressed as improper fractions
		e.g. $\frac{14}{3} \times \frac{9}{10}$			M1 <b>or</b> for both fractions expressed as equivalent fractions with denominators that are a common multiple of 3 and 9 eg. $\frac{42}{9} \div \frac{10}{9}$ <b>or</b> $\frac{126}{27} \div \frac{30}{27}$
		e.g. $\frac{14}{3} \times \frac{9}{10} = \frac{126}{30} = \frac{21}{5} = 4\frac{1}{5}$ <b>or</b> $\frac{14}{3} \times \frac{9}{10} = \frac{126}{30} = 4\frac{6}{30} = 4\frac{1}{5}$ <b>or</b> $\frac{14^7}{3^1} \times \frac{9^3}{10^5} = \frac{21}{5} = 4\frac{1}{5}$ <b>or</b> $\frac{126}{27} \div \frac{30}{27} = \frac{126}{30} = \frac{21}{5} = 4\frac{1}{5}$	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
					<b>Total 3 marks</b>

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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)	$\frac{7}{13} \times \frac{6}{9} \left( = \frac{42}{117} = \frac{14}{39} = 0.35(897\dots) \right)$ <b>or</b> $\frac{8}{14} \times \frac{7}{13} \left( = \frac{56}{182} \text{oe} \right)$ <b>or</b> $\frac{7}{10} \times \frac{6}{9} \left( = \frac{42}{90} \right)$		3	M1 ft from (a) $\left(\frac{7}{13} = 0.54 \text{ to } 2\text{dp}\right)$ $\frac{6}{9} = 0.67 \text{ to } 2\text{dp}$
		$"\frac{42}{117}" \times " \frac{2}{5} "$ <b>or</b> $\left(\frac{8}{14} \times \frac{7}{13}\right) \times \left(\frac{7}{10} \times \frac{6}{9}\right)$			M1 ft from (b)
			$\frac{28}{195}$ oe		A1 for $\frac{28}{195}$ oe, e.g. 0.14(3589...) from accurate working
					<b>Total 7 marks</b>

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

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Question	Working	Answer	Mark	Notes
7	(a)			
	<p><b>Examples</b>            There are no members that are in both <math>A</math> and <math>B</math>            No members in common (in <math>A</math> and <math>B</math>)            No numbers the same (in <math>A</math> and <math>B</math>)  <math>B</math> has even numbers. <math>A</math> has odd numbers except 2 which is not in <math>B</math>            Nothing in <math>A</math> is in <math>B</math> or            No overlap  <math>A</math> and <math>B</math> don't share any numbers</p>	Correct statement	1	B1 for a statement which indicates correct meanings for intersection and empty set
	(b)	1 and 9	1	B1
	(c)	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)
	e.g.			
				<b>Total 4 marks</b>

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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
	$\sqrt{6^2 + 6^2} (= \sqrt{72} = 6\sqrt{2} = 8.4(85\dots)$ or 8.5) or $AC = \frac{6(\sin 90)}{\sin 45} = 6\sqrt{2} = 8.4(85\dots)$ or 8.5) oe			M1
	$0.5 \times \pi \times \left(\frac{"8.48.."}{2}\right)^2 (= 9\pi$ or 28....)			M1
		46.3		A1 for 46.2 – 46.3
				<b>Total 5 marks</b>

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Question		Working	Answer	Mark	Notes
9		$15 \div 20 (=0.75)$ $48 \div 15 (=3.2)$ $21 \div 5 (=4.2)$ $16 \div 10 (=1.6)$	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.]
					<b>Total 3 marks</b>

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
		$4m + 6m = 21 - 9$ <b>or</b> $10m = 12$ <b>or</b> $-21 + 9 = -6m - 4m$ <b>or</b> $-10m = -12$			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) <b>or</b> $m = -0.2$ oe with working shown (from $4m + 9 = 7 - 6m$ oe)]



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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 <b>or</b> 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		$2x + 0.18 + 2x + 3x + 0.26 + x = 1$ <b>or</b> $1 - (0.18 + 0.26) (= 0.56)$		4	M1
		$x = (1 - 0.18 - 0.26) \div (2 + 2 + 3 + 1) (=0.07)$			M1
		eg $(0.18 + 4 \times "0.07") \times 200$ <b>or</b> $0.46 \times 200$ <b>or</b> $36 + 42 + 14$ oe			M1 dep on M2 and probabilities between 0 and 1 <b>or</b> $\frac{92}{200}$ , oe with 92 seen
			92		A1
					<b>Total 4 marks</b>

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

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 <b>and</b> expanding the bracket
	$y^2 + 2 = x(3 - y^2)$ oe			M1 for isolating terms in $x$ <b>and</b> 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
				<b>Total 4 marks</b>

Question	Working	Answer	Mark	Notes
14	5.5 or 6.5 or 12.5 or 17.5		3	M1 Accept 6.49 for 6.5 and 17.49 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
				<b>Total 3 marks</b>

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

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

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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 $n \neq 1$ ) <b>or</b> for $(x - m)^2 + 1$ (where $m \neq 3$ ) <b>or</b> 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
					<b>Total 6 marks</b>

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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 $(2x + 5)$  <b>or</b>  denominator into 2 brackets where one of the factors must be $(2x + 5)$
	$x(2x + 5)(3x - 1)$ or $(2x + 5)(3x^2 - x)$ <b>and</b> $(2x + 5)(2x - 5)$ oe			M1 for a correct factorisation of the  numerator into 2 or 3 factors where one of the factors must be $(2x + 5)$  <b>and</b>  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
				<b>Total 3 marks</b>

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Question		Working	Answer	Mark	Notes
19		$\left(\frac{10+2}{2}, \frac{7+19}{2}\right)$ <b>or</b> (6, 13)		5	M1
		$\frac{19-7}{10-2} \left( = \frac{12}{8} \right)$ oe <b>or</b> 1.5 oe			M1
		$m \times \frac{3}{2} = -1$ oe <b>or</b> $m = -\frac{2}{3}$			M1 for use of $m_1m_2 = -1$
		“13” = “ $-\frac{2}{3}$ ” × “6” + $c$ <b>or</b> $c = 17$ oe <b>or</b> $y - \text{“13”} = -\frac{2}{3}(x - \text{“6”})$			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 $3y + 2x = 51$ <b>or</b> $3y = -2x + 51$ etc but must be integer coefficients
					<b>Total 5 marks</b>

Question		Working	Answer	Mark	Notes
20		$(8 =) 2 \times 2 \times 2$ 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
					<b>Total 2 marks</b>

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



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

### Performance data for Practice Test 1H (Set 10)

	Mean score	Max score	Mean %	Edexcel averages: scores of candidates who achieved grade:								
				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	
	<b>47.52</b>	<b>80</b>	<b>59</b>	<b>47.52</b>	<b>68.94</b>	<b>57.32</b>	<b>47.70</b>	<b>38.95</b>	<b>30.68</b>	<b>22.54</b>	<b>16.51</b>	

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### Suggested grade boundaries

<b>1MA1 Practice Tests (Set 10)</b>			<b>9</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
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		
<b>Total</b>	<b>Higher tier</b>		<b>123</b>	<b>99</b>	<b>81</b>	<b>65</b>	<b>49</b>	<b>35</b>	<b>28</b>		

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