

Practice Test 2H-3H (Set 11) – Higher tier mark scheme

Question	Working	Answer	Mark	Notes
1	$55 \div (6 + 3 + 2) \{= 5\}$ $(6 \times "5") - (2 \times "5")$	20	3	M1 6 M1 Or $\frac{6}{11} \times 55 (= 30)$ or $\frac{2}{11} \times 55 (= 10)$ A1 Or M2 for Won = 30 and Lost = 10 (can be seen in a ratio 30 : 15: 10)
				Total 3 marks

Question	Working	Answer	Mark	Notes
2	e.g. $720 = 2 \times 360 = 2 \times 2 \times 180$ or $720 = 3 \times 240 = 3 \times 3 \times 80$ etc		3	M1 At least 2 correct stages in prime factorisation
	2, 2, 2, 2, 3, 3, 5			M1 condone inclusion of 1 (may be a fully correct factor tree or ladder)
		$2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5$		A1 dep on M2, accept $2^4 \times 3^2 \times 5$
				Total 3 marks

Question	Working	Answer	Mark	Notes
3	$4y - y \leq 8 + 13$		2	M1 Arranging y 's on one side and the numbers on the other side. (allow $4y - y = 8 + 13$ oe or $4y - y < 8 + 13$ oe or $4y - y > 8 + 13$ oe or $4y - y \geq 8 + 13$ oe)
		$y \leq 7$ oe		A1 Allow $y \leq 21/3$
				Total 3 marks

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Question		Working	Answer	Mark	Notes	
4		P(mint =) $1 - (0.35 + 0.32 + 0.12) \{= 0.21\}$ P(strawberry or mint =) $0.32 + "0.21"$	0.53 oe	3	M1 M1 A1	Or a correct equation summing to 1 Dep Allow 0.53/1
						Total 3 marks

Question		Working	Answer	Mark	Notes	
5		150000×0.82^3	82705	3	M2 A1	If not M2 then M1 for 1st year e.g $150000 \times 0.82 (= 123000)$ or $150000 \times 0.18 (= 27000)$ SC B1 for $150000 \times 1.18 (= 177000)$ or $150000 \times 1.18^3 (= 246454.8)$ or $150000 \times 0.54 (= 81000)$ or $150000 \times 0.46 (= 69000)$ Accept 82705.2
						Total 3 marks

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Question	Working	Answer	Mark	Notes
6	$\sin 32 = \frac{BD}{3.1}$ oe $(BD =) 3.1 \times \sin 32$ (= 1.6427...) $\cos 42 = \frac{3.1 \sin 32}{AB}$ oe or $\frac{AB}{\sin 90} = \frac{3.1 \sin 32}{\sin 48}$ oe $AB = \frac{3.1 \sin 32}{\cos 42}$ or $AB = \frac{3.1 \sin 32}{\sin 48}$	2.21	5	M1 A correct calculation involving BD M1 Accept 1.6 or better M1 Dep or $(AD =)$ “1.6.. x tan 42 {= 1.479} M1 Or $(AB =) \sqrt{1.479^2 + 1.6427^2}$ A1 2.21053... (Accept 2.2 → 2.22)
				Total 5 marks

Question	Working	Answer	Mark	Notes
7	$9.45 \div 108$ (= 0.0875) oe $9.45 \div 108 \times 100$ oe	8.75	3	M1 M1 M2 for $9.45 \div 1.08$ A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
8	10×79.2 (= 792) or 3×68 (= 204) $(10 \times 79.2 - 3 \times 68) \div 7$	84	3	M1 M1 A1
				Total 3 marks

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Question	Working	Answer	Mark	Notes
9	Ext $\angle = 180 - 162 (= 18)$ oe or $\frac{(n-2)180}{n} = 162$ oe		3	M1
	$360 \div "18"$ oe or $18n = 360$			M1
		20		A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
10		5	1	B1
				Total 1 mark

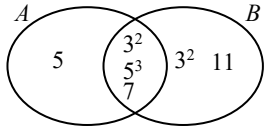
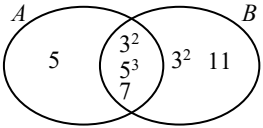
Question	Working	Answer	Mark	Notes
11	$22 \times 60 \times 60 (= 79\ 200)$ oe or $22 \div 1000 (= 0.022)$ oe		3	M1 for converting from m/s to m/h or from m to km
	$22 \times 60 \times 60 \div 1000$ oe			M1 for a complete method
		79.2		A1 oe, dep on at least M1
				Total 3 marks

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Question	Working	Answer	Mark	Notes
12	$ABD = 98^\circ \div 2 (= 49^\circ)$ or $ABC = 90^\circ$ <u>Angle at centre / middle is twice angle at circumference</u> <u>Angle in a semicircle / from a diameter is 90° / right angle</u> $DBC = (90 - 49) = 41$	41°	4	M1 Correct angle stated or seen on diagram B1 B1 Dep M1 A1 Dep M1 Correct answer + no reasons = M1A1
	Alt: $180 - 98 (= 82^\circ)$ $OAD = 82 \div 2 (= 41^\circ)$ Base / bottom angles in an <u>isosceles triangle</u> are equal $DBC = 41^\circ$ <u>Angles in the same segment / from the same chord (DC) are equal</u>	41°		M1 Correct angle stated or seen on diagram B1 Dep M1 B1 A1 Dep M1 Correct answer + no reasons = M1A1
	Alt: $DOC = 180 - 98 (= 82^\circ)$ <u>Angles on a straight line = 180°</u> $DBC = 41^\circ$ <u>Angle at centre / middle is twice angle at circumference</u>	41°		M1 Correct angle stated or seen on diagram B1 Dep M1 B1 A1 Dep M1 Dep M1 Correct answer + no reasons = M1A1
				Total 4 marks

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Question	Working	Answer	Mark	Notes
13	e.g. $\pi \times 8.2^2 (= 211.24\dots, \frac{1681}{25}\pi)$ or $1.5 \times 1000 (= 1500)$ or $\pi \times 8.2^2 \times 10 (= 2112.4\dots, \frac{3362}{5}\pi)$		3	M1 for a correct first step
	e.g. $(1.5 \times 1000) \div (\pi \times 8.2^2) (= 7.1009\dots)$ or $(1.5 \times 1000) \div \text{“}2112.4\text{”} \times 10 \text{ oe } (= 7.1009\dots)$ or $10 - ((\text{“}2112.4\text{”} - 1.5 \times 1000) \div (\pi \times 8.2^2)) (= 7.1009\dots)$			M1 for a complete method to find the depth of the water or an answer of 2.89 – 2.91
		7.1		A1 accept 7.09 – 7.11
Total 3 marks				

Question	Working	Answer	Mark	Notes
14 (a)		7875	2	M1 $3^2 \times 5^3 \times 7$ oe or correct Venn diagram A1
(b)		3 898 125	2	M1 $3^4 \times 5^4 \times 7 \times 11$ oe or correct Venn diagram A1
Total 4 marks				

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Question		Working	Answer	Mark	Notes	
15	(a)	$y = \frac{k}{x^2}$ condone proportion symbol in place of = $16 = \frac{k}{1.5^2}$ or $9 = \frac{k}{2^2}$ or $4 = \frac{k}{3^2}$ or $2.25 = \frac{k}{4^2}$	$y = \frac{36}{x^2}$	3	M1 M1 A1	Setting up a correct equation “ k ” \neq 1 Using the values from the table to find the value of the constant or “ k ” = 36 $\frac{36}{x^2} =$ M2 A0
					M1	Substituting $y = 144$ into the correct equation and making x^2 or x the subject.
				0.5 oe	2	A1
					Total 5 marks	

Question		Working	Answer	Mark	Notes
16		$15 - 3 : x - 3 = 2 : 7$ or $(15 - 3) \div 2 (= 6)$	$(n =) (15 - 3) \div \frac{2}{2+7} (= 54)$ where n is the total age 3 years ago	3	M1 M2 for $\frac{(15-3) \times 7}{2} (= 42)$
				$\frac{x-3}{15-3} = \frac{7}{2}$ oe or $7 \times "6" (= 42)$	$\frac{"54"}{2+7} (= 42)$
				45	A1
					Total 3 marks

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Question	Working	Answer	Mark	Notes
17	3.455 or 3.465 or 6.25 or 6.35 $\frac{6 \times 3.465}{6.25 - 3.465}$	7.46	3	M1 Accept $3.464\dot{9}$ for 3.465 or $6.34\dot{9}$ for 6.35 M1 $\frac{6 \times UB_a}{LB_b - UB_a}$ where $3.46 < UB_a \leq 3.465$ and $6.25 \leq LB_b < 6.3$ Dep M2 Accept $7.46499 \dots$
				Total 3 marks

Question	Working	Answer	Mark	Notes
18	$(LSF =) \sqrt{240 \div 540}$ or $\frac{2}{3}$ or $\frac{3}{2}$ or 1.5 or $3 : 2$ or $2 : 3$ $(\frac{2}{3})^3 \times 2025$ oe accept $0.0.66$ or better for $2/3$	600	3	M1 Full method leading to correct answer M1 A1
				Total 3 marks

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Question	Working	Answer	Mark	Notes
19	$\frac{25}{2}\pi = \pi r^2 \times \frac{80}{360}$ $r = 7.5$		6	M1 A1 Equation of sector equal to $\frac{25\pi}{2}$ or a calculation that leads to r or r^2
	$(APB \Rightarrow) 2 \times \pi \times 7.5 \times \frac{80}{360} (= 10.471)\dots$ $(APB \Rightarrow) 10.471\dots (= 10\pi/3)$			M1ft Dep on 1 st M1 Accept 10.5 or better
	$[(AB)^2] = [7.5]^2 + [7.5]^2 - (2 \times 7.5 \times 7.5 \times \cos 80)$ $\frac{AB}{\sin 80} = \frac{7.5}{\sin 50}$ $\text{or } (AB \Rightarrow) 2 \times 7.5 \times \sin 40$ $(AB \Rightarrow) 9.6418$			M1ft Dep on 1 st M1 Correct equation to find AB (= 9.6) or AB^2 (= 93 or better) must use a clearly identified radius value
	$"9.6418" + "10.4719"$	20.1		M1ft A1 Dep on 2 nd and 3 rd method marks awrt 20.1
				Total 6 marks

Practice Test 2H-3H (Set 11) – Higher tier mark scheme

Question	Working	Answer	Mark	Notes
20	$360 = (10 \times 10) + 4 \times 0.5 \times 10 \times "h" \text{ oe}$ $h = 13$			M1 Finding the perpendicular height of a triangular face A1
	$AC = \sqrt{13^2 + 5^2} = (13.93 \text{ or } \sqrt{194}) \text{ or}$ $AO = \sqrt{13^2 - 5^2} = (12) \text{ or}$ $OC = (\sqrt{10^2 + 10^2}) \div 2 = (7.07 \text{ or } 5\sqrt{2}) \text{ or}$			M2 Finding the accurate length of two sides <u>relevant to finding correct angle</u> . M2 for two sides found or M1 for one side. 1dp rounded or truncated.
	$EC \text{ (oe)} = \sqrt{10^2 + 10^2} = (14.14 \text{ or } 10\sqrt{2})$ $\tan^{-1}\left(\frac{12}{7.07}\right) \text{ or } \cos^{-1}\left(\frac{7.07}{13.93}\right) \text{ or } \sin^{-1}\left(\frac{12}{13.93}\right)$ or $\cos^{-1}\left(\frac{13.93^2 + 7.07^2 - 12^2}{2 \times 13.93 \times 7.07}\right)$ or $\cos^{-1}\left(\frac{13.93^2 + 14.14^2 - 13.93^2}{2 \times 13.93 \times 14.14}\right)$	59.5°		M1 A correct trigonometric expression to find correct angle Accept $\tan \theta = \left(\frac{12}{7.0}\right)$ etc A1 Accept 59.4° – 59.7°
				Total 6 marks

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Question	Working	Answer	Mark	Notes
21	$525 \div 100^2$	0.0525 oe	2	M1 $\frac{525}{100^2}$ A1 Accept 5.25×10^{-2}
				Total 2 marks

Question	Working	Answer	Mark	Notes
22	$ABF = 180 - x$ or $CDF = 180 - x$		4	M1 for finding an expression for ABF or CDF . May be seen on diagram.
	$FDE = 180 - (180 - x) (= x)$ AFB or $ACE = 180 - (180 - x) - 54 (= x - 54)$ DFE or $ACE = 180 - x - 32 (= 148 - x)$ e.g. $54 + y + 180 - x = 180$ where $AFB = y$ $32 + y + (180 - (180 - x)) = 180$ where $DFE = y$			M1 method to find FDE and AFB or method to find FDE and DFE or method to find ACE or method to find FDE and an equation for AFB e.g. $54 + y + 180 - x = 180$ where $AFB = y$ or method to find FDE and an equation for DFE e.g. $32 + y + (180 - (180 - x)) = 180$ where $DFE = y$ May be seen on diagram.
	e.g. $32 + x + x - 54 = 180$ or $54 + 180 - x + 148 - x = 180$ or $x - 54 = 148 - x$ oe or $54 + y + 180 - x = 180$ and $32 + y + (180 - (180 - x)) = 180$ where $AFB = DFE = y$			M1 for setting up an equation or a pair of correct simultaneous equations to solve for x
		101		A1 dep on at least M1
				Total 4 marks

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Question	Working	Answer	Mark	Notes
23	e.g. $(220 - 180) + (360 - 280) (= 120)$		5	M1 for a method to find angle XYZ . Could be seen on a diagram
	$XZ = \sqrt{3.5^2 + 6^2 - 2 \times 3.5 \times 6 \times \cos("120")}$ ($= 8.3\dots$ or $\frac{\sqrt{277}}{2}$)			M1
	$\frac{\sin YXZ}{6} = \frac{\sin("120")}{"8.32\dots"}$			M1 or $6^2 = 3.5^2 + "8.32"{}^2 - 2 \times 3.5 \times "8.32" \times \cos YXZ$
	$YXZ = \sin^{-1}\left(\frac{6 \sin("120")}{"8.32\dots"}\right)$ ($= 38.6\dots$)			M1 or $YXZ = \cos^{-1}\left(\frac{3.5^2 + "8.32"{}^2 - 6^2}{2 \times 3.5 \times "8.32"}\right)$ ($= 38.6\dots$)
		241.4		A1 accept 241.2 – 241.4
				Total 5 marks

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Performance data for Practice Test 2H-3H (Set 11)

New Qn	Mean score	Max score	Mean %	ALL	9	8	7	6	5	4	3
1	2.67	3	89	2.67	2.93	2.89	2.82	2.75	2.48	2.14	1.31
2	2.62	3	87	2.62	2.92	2.82	2.80	2.60	2.32	2.11	1.46
3	1.70	2	85	1.70	1.96	1.89	1.77	1.66	1.48	1.19	1.06
4	2.55	3	85	2.55	2.87	2.71	2.58	2.53	2.38	2.11	1.48
5	2.51	3	84	2.51	2.94	2.77	2.60	2.45	2.17	1.83	1.23
6	3.93	5	79	3.93	4.92	4.75	4.38	3.78	2.96	1.36	0.48
7	2.15	3	72	2.15	2.94	2.72	2.30	1.83	1.23	0.73	0.20
8	2.14	3	71	2.14	2.91	2.69	2.37	1.80	1.22	0.72	0.46
9	2.07	3	69	2.07	2.93	2.74	2.25	1.59	1.06	0.55	0.21
10	0.64	1	64	0.64	0.86	0.74	0.66	0.59	0.44	0.26	0.12
11	1.93	3	64	1.93	2.65	2.24	1.96	1.64	1.30	1.05	0.71
12	2.43	4	61	2.43	3.40	2.89	2.52	1.98	1.54	1.12	0.72
13	1.76	3	59	1.76	2.63	2.08	1.68	1.31	1.05	0.89	0.78
14	1.18	2	59	1.18	1.78	1.51	1.20	0.89	0.61	0.33	0.14
	1.04	2	52	1.04	1.75	1.36	0.99	0.66	0.39	0.21	0.13
15	1.95	3	65	1.95	2.92	2.62	2.09	1.44	0.85	0.30	0.19
	1.18	2	59	1.18	1.93	1.68	1.24	0.72	0.30	0.07	0.03
16	1.70	3	57	1.70	2.63	2.09	1.68	1.22	0.89	0.67	0.41
17	1.62	3	54	1.62	2.67	2.17	1.66	1.02	0.54	0.16	0.05
18	1.55	3	52	1.55	2.84	2.29	1.44	0.64	0.22	0.06	0.04
19	2.87	6	48	2.87	5.41	4.27	2.67	1.00	0.33	0.05	0.00
20	2.30	6	38	2.30	4.77	3.03	1.86	0.89	0.37	0.08	0.01
21	0.68	2	34	0.68	1.42	0.83	0.52	0.30	0.17	0.08	0.08
22	0.83	4	21	0.83	2.45	0.85	0.22	0.09	0.04	0.00	0.01
23	0.94	5	19	0.94	2.82	0.93	0.23	0.06	0.04	0.00	0.01
	46.94	80	1527	46.94	70.25	57.56	46.49	35.44	26.38	18.07	11.32

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Suggested grade boundaries

1MA1 Practice Tests (Set 10)			9	8	7	6	5	4	3	2	1
1H	Higher tier	Paper 1H	62	49	37	28	21	14			
2H/3H	Higher tier	Paper 2H/3H	64	52	41	31	22	15			
Total	Higher tier		135	109	85	65	48	33			

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