Practice Tests Set 23 – Paper 2H-3H mark scheme

Question	Working	Answer	Mark	Notes
1 (a)		0.000 625	1	B1
(b)	25 000 000 oe e.g. 25×10^6 or 0.25×10^8 **or** 2.5×10^n $n \neq 7$		2	M1
	Correct answer scores full marks (unless from obvious incorrect working)	2.5×10^7		A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
2 (a)		8 and 4.5	1	B1 allow $\frac{9}{2}$ oe May be awarded if plotted correctly on the graph
(b)		Correct graph	2	M1 ft for at least 5 points plotted correctly (± half square)
	Correct answer scores full marks (unless from obvious incorrect working)			A1 for correct curve between $x = 0.5$ and $x = 5$ (clear intention to go through all the points and which must be curved) **Note**: If a fully correct graph is shown, but an incomplete table is shown in (a), then award the marks for (a)
				Total 3 marks

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Question	Working	Answer	Mark	Notes
3	3 × 180 (= 540) or 360 – [(180 – 90) + (180 – 135) + (180 – 67) + (180 – 119)] (= 51) or 360 – (90 + 45 + 113 + 61) (= 51)		3	M1
	90 + 135 + 67 + 119 + *x* = "540" oe 411 + *x* = "540" oe or "540" – (90 + 135 + 67 + 119) or 3 × 180 – (90 + 135 + 67 + 119) oe or 540 – 411 or 180 – "51" oe			M1
	Correct answer scores full marks (unless from obvious incorrect working)	129		A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
4	1 – (0.24 + 0.4) (= 0.36) oe or $3x + x = 1 – (0.24 + 0.4)$ oe		4	M1
	48 ÷ 0.24 (= 200) or "0.36" ÷ 4 (= 0.09) or "0.36" ÷ 4 × 3 (= 0.27)			M1
	"0.27" × "200" or "200" × "0.36" ÷ 4 × 3 ("200" – 48 – "80") ÷ 4 × 3			M1 for a complete method
		54		A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
4 **ALT**	1 – (0.24 + 0.4) (= 0.36) oe or $3x + x = 1 – (0.24 + 0.4)$ oe		4	M1
	48 ÷ 24 (= 2) oe or $\left(\frac{"0.36"}{4}\times 3\right)\div 0.24\left(=\frac{9}{8}=1.125\right)$ oe or $\left(\frac{"36"}{4}\times 3\right)\div 24\left(=\frac{9}{8}=1.125\right)$ oe			M1
	$"2"\times\left(\frac{"36"}{4}\times 3\right)$ oe or $"\frac{9}{8}"\times 48$ oe or $\left("27"\div 24\right)\times 48$ oe			M1 for a complete method
	Correct answer scores full marks (unless from obvious incorrect working)	54		A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
5 (a)	$(y\pm6)(y\pm8)$ or $y(y+6)-8(y+6)$ or $y(y-8)+6(y-8)$		2	M1 or for $(y \pm a)(y \pm b)$ where $ab = -48$ or $a + b = -2$
		$(y+6)(y-8)$		A1 oe Allow any letter for y
(b)		$x \leq 3$	1	B1 allow $3 \geq x$ Allow any letter for x
(c)	$6-14>12w-7w$ oe or $7w-12w>14-6$ oe		3	M1 Condone = rather than > or any other sign for this mark.
	$-8>5w$ or $-5w>8$ or $-w>\frac{8}{5}$ or $w>-\frac{8}{5}$ or $w=-\frac{8}{5}$ oe			M1 Condone = rather than > or any other sign for this mark.
	Correct answer scores full marks (unless from obvious incorrect working)	$w<-\frac{8}{5}$		A1 oe accept $-\frac{8}{5}>w$ Must have correct sign on answer line dep on M1 (sight of correct answer in working space and just $(w=)-\frac{8}{5}$ oe on answer line gains M2 only)
				Total 6 marks

Question	Working		Answer	Mark	Notes	
6	$\frac{2.9}{100} \times 5000 (= 145)$ oe **or** 1.029 × 5000 (=5145) oe **or** 1.029^2 × 5000 (= 5294….) oe **or** 0.058 × 5000 (= 290) oe **or** 1.058 × 5000 (= 5290)				M1 **Bank H**	
	5000 × 0.016 oe (= 80) oe **or** 5000 × 1.016 oe (= 5080) oe **or** 5000 × 0.032 (= 160) oe **or** 5000 × 1.032 (= 5160) oe	M2 for 5000 × 1.016^2 (= 5161.28)		4	M1 **Bank G**	
	(80 + 5000) × 0.016 (= 81.28) oe **or** 5080 × 1.016 (= 5161.28) oe				M1 **Bank G**	
	Correct answer scores full marks (unless from obvious incorrect working)		16.28		A1	
						Total 4 marks

Question	Working	Answer	Mark	Notes
7 (a)	18 000 + 14 × 1160 (= 34 240) oe or 18 000 + 16 240 (= 34 240)		4	M1
	"34 240" – 32 000 (= 2240) or $\frac{\text{"34 240"}}{32\,000}$ (= 1.07)			M1
	$\frac{\text{"2240"}}{32\,000}(\times 100)$ or $\frac{\text{"34 240"}}{32\,000}\times 100$ (= 107) or "1.07" – 1 (= 0.07)			M1
	Correct answer scores full marks (unless from obvious incorrect working)	7		A1
(b)	e.g. 1 − 0.15 (= 0.85) or 100(%) − 15(%) (= 85(%))		3	M1
	e.g. 39 865 ÷ 0.85 or 39 865 ÷ 85 × 100 oe			M1
	Correct answer scores full marks (unless from obvious incorrect working)	46 900		A1
				Total 7 marks

Qn	Working	Answer	Mark	Notes	
8	90 × 1000 (=90 000) or $\frac{90}{60\times60}(=0.025$ or $\frac{1}{40})$ **or** $\frac{1000}{60\times60}(=\frac{5}{18}=0.277...)$ **or** sight of 1500		3	M1 For one of ×1000 (eg sight of 90 000) or (÷60 ÷ 60) or ÷3600 oe ie correct conversion of distance units or of time units	M2 for 90 ÷ 3.6 **or** $90\times\frac{5}{18}$
	$\frac{90\times1000}{60\times60}$ oe eg$(1.5\times1000)\div60$			M1 For a fully correct method with correct use of brackets eg 90 000 ÷ 60 × 60 is M1 only if not recovered	
	Working required	25		A1 dep on M1	
					Total 3 marks

Question	Working	Answer	Mark	Notes
9	eg $20\times\frac{x+3}{4}-20\times\frac{7-x}{5}=20\times4.3$ or eg $5(x+3)-4(7-x)=20\times4.3$ or eg $\frac{5(x+3)}{20}-\frac{4(7-x)}{20}(=4.3)$ or eg $\frac{5(x+3)-4(7-x)}{20}(=4.3)$		3	M1 For clear intention to multiply all terms by 20 (or 4 × 5) or a multiple of 20 oe or to express LHS as two fractions over 20 (or 4 × 5) or a multiple of 20 oe or as a single fraction with a denominator of 20 (or 4 × 5) or a multiple of 20 oe if expanded numerator, allow one error
	eg $5x + 15 – 28 + 4x = 4.3 \times 20$ oe eg $9x – 13 = 86$ eg $9x = 99$			M1 Expanding brackets and multiplying by denominator with no more than one error in total from multiplying out brackets [we must see 4.3 × 20 or 86 accurately]
	Working required	11		A1 dep on M1
				Total 3 marks

Question	Working	Answer	Mark	Notes
10	$r=\sqrt{\frac{49\pi}{4\pi}}$ oe (= 3.5)		3	M1
	[volume =] $\frac{4}{3}\times\pi\times"3.5"^3$			M1
	Correct answer scores full marks (unless from obvious incorrect working)	180		A1 awrt 180
				Total 3 marks

Question	Working	Answer	Mark	Notes
11	$6 \times 11 + 18 \times 25 + 30 \times 23 + 42 \times 15 + 54 \times 6$ (= 2160) **or** 66 + 450 + 690 + 630 + 324 (= 2160) [lower bound products are: 0, 300, 552, 540, 288] [upper bound products are: 132, 600, 828, 720, 360]		4	M2 for at least **4** correct products added (need not be evaluated) **or** If not M2 then award: M1 for consistent use of value within interval (including end points) for at least **4** products which must be added or correct midpoints used for at least **4** products and not added
	"2160" ÷ "80"			M1 dep on at least M1 Allow division by their Σf provided addition or total under column seen
	Correct answer scores full marks (unless from obvious incorrect working)	27		A1
				Total 4 marks

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Question	Working	Answer	Mark	Notes
12	eg $5x - 1 = 3x + 7.4$ oe **or** eg $10x - 2 + 48$ **or** $6x + 14.8 + 48$ **or** $24 + 24 + 5x - 1 + 3x + 7.4$ oe		4	M1 a correct equation to find x **or** a correct expression for the perimeter in terms of x
	$x = 4.2$			A1 the correct value of x (implies previous mark)
	$2 \times 24 + 2(5 \times$ "4.2" $- 1)$ oe **or** $2 \times 24 + 2(3 \times$ "4.2" $+ 7.4)$ oe **or** $2 \times 24 + (5 \times 4.2 - 1) + (3 \times 4.2 + 7.4)$ oe eg $24 + 24 + 20 + 20$ oe			M1dep on a correct method to find the perimeter – use of positive x from correct working (1st M1 awarded for an equation) **and** only if used the same measurement for AD and BC
	working required	88		A1 cao dep on either M1 or $x = 4.2$
				Total 4 marks

Question		Working	Answer	Mark	Notes
13	(a)		2.745	1	B1
	(b)		2.755	1	B1 allow $2.754\dot{9}$
	(c)	$(80 \times 60) \div 2^2$		2	M1 For two of 80, 60, 2 or 4 rather than 2^2 oe
		eg $(80 \times 60) \div 2^2 = 1200$ oe *working with rounded values seen required*	1200		A1 dep on M1 for answer coming from use of the 3 rounded numbers – if 1200 seen then ignore any other working and comments
					Total 4 marks

Practice Tests Set 23 – Paper 2H-3H mark scheme

Question	Working	Answer	Mark	Notes	
14	$\cos 50 = \frac{18}{(AB)}$ or $\sin 40 = \frac{18}{(AB)}$ or $\frac{(AB)}{\sin 90} = \frac{18}{\sin 40}$		5	M1	M2 for $(AB =)\sqrt{18^2 + (18\tan 50)^2}$ oe (= 28.0030…) or 28
	$(AB =)\frac{18}{\cos 50}(= 28.0030...)$oe or 28 or $(AB =)\frac{18}{\sin 40}(= 28.0030...)$oe or 28			M1	
	$\frac{1}{2} \times \pi \times$"28.0030..."$(= 43.9...)$oe or 44 $\pi \times$"28.0030..."$(= 87.9...)$oe or 88			M1 for use of πd or $\frac{1}{2}\pi d$ oe Allow any value of $AB > 18$ if M2 not scored	
	"28…" + "43.9…" (= 71.9900…) or "28" + "44"			M1ft from previous M1 Allow *their d* + *their* $\frac{1}{2}\pi d$	
	Correct answer scores full marks (unless from obvious incorrect working)	72		A1 awrt 72	
					Total 5 marks

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Question	Working	Answer	Mark	Notes
15	2 : 3 : 15 oe or 20 or (1 : 5) × 3 or (1 : 5 =) 3 : 15 or $2n$: $3n$: $15n$ e.g. 4 : 6 : 30 or G(reen) = 2, O(range) = 3 , Y(ellow) = 15		3	M1
	$\frac{2}{"20"}$ × ¥ 280 oe or 14 × 2 or $\frac{2}{"2"+"3"+"15"}$ × ¥ 280 oe or $\frac{2n}{"2n"+"3n"+"15n"}$ × ¥ 280 oe			M1
	Correct answer scores full marks (unless from obvious incorrect working)	28		A1 or 28 : 42 : 210 or 28 , 42 , 210 If not in this order must be labelled correctly
				Total 3 marks

Practice Tests Set 23 – Paper 2H-3H mark scheme

Question	Working	Answer	Mark	Notes
16 (a)	FD are: 6, 7, 5, 4, 1.8		3	M1 For at least two frequency densities correct or at least two correct bars
				M1 For at least 4 correct frequency densities or 4 correct bars
	A fully correct histogram gains full marks	Correct histogram		A1 Fully correct histogram SCB2 for all five bars of correct width with heights in the correct ratio (eg drawn at 0.6, 0.7, 0.5, 0.4, 0.18) SCB1 for three bars of correct width with heights in the correct ratio
(b)	$(9 + \frac{2}{3} \times 12)$ (= 17) oe eg 9 + 8 (= 17) or $55 - (12 + 7 + 15 + \frac{1}{3} \times 12)$		2	M1 may be seen as numerator of fraction (ft their graph dep on M1 in (a))
	Correct answer scores full marks (unless from obvious incorrect working)	$\frac{17}{55}$		A1cao Or 0.30909…or 30.909….% (to at least 2 sf) SCB1 for $\frac{38}{55}$(0.6909…)
				Total 5 marks

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Question	Working	Answer	Mark	Notes
17	$[k =]\ \frac{6+17}{2}$ **or** $[k =] 6+\frac{17-6}{2}$ oe **or** $[j =]\ 4+2(15-4)$ **or** $[j =]\ 15 + (15 - 4)$ **or** $\frac{4+j}{2}=15$ oe		3	M1
	Correct answers score full marks (unless from obvious incorrect working) *1 correct answer will score M1A1 and both will score M1A1A1*	26		A1
		11.5		A1 oe eg $\frac{23}{2}$ both answers the wrong way round scores M1A1 unless the correct answers are clearly labelled in working space
				Total 3 marks

Question	Working	Answer	Mark	Notes
18			3	M1 4 and 34 clearly indicated – either in list or in working (condone 26 also indicated in list)
				A1 For IQR for team **A** = 34 – 4 (= 30)
		The IQR for Team **B** was higher than the IQR for Team **A** oe or Team **B** had an interquartile range of "12" more than team **A** **or** The runs scored were more spread out for Team **B** than for Team **A** oe **or** The runs for Team **A** were more consistent oe		B1ft Must ft dep on IQR stated for team **A** Either comparing the IQR correctly or for giving a comparison in context about spread as long as not contradicted by further statements as this would be choice **NOT** Team **B** scored more runs than team **A** The average score of **B** is higher than the average score of **A** The IQR of **A** was 30 while the IQR of **B** was 42 The range of **B** was more than the range of **A**
				Total 3 marks

Question	Working	Answer	Mark	Notes
19	45.225 or 45.235 or 5.115 or 5.125 or 8.45 or 8.55		5	B2 for all 6 correct (B1 for 4 or 5 correct) Accept $45.234\dot{9}$ for 45.235 $5.124\dot{9}$ for 5.125 $8.54\dot{9}$ for 8.55
	$\frac{45.235-5.115}{8.45}(=4.7479\ldots)$			M1 for correct substitution into the *UB* $a=\frac{v-u}{t}$ where $45.23 < v_{(UB)} \leq 45.235$ $5.115 \leq u_{(LB)} < 5.12$ $8.45 \leq t_{(LB)} < 8.5$
	$\frac{45.225-5.125}{8.55}(=4.6900\ldots)$			M1 for correct substitution into the *LB* $a=\frac{v-u}{t}$ where $45.225 \leq v_{(LB)} < 45.23$ $5.12 < u_{(UB)} \leq 5.125$ $8.5 < t_{(UB)} \leq 8.55$
	Working required	4.7 and correct reason		A1 dep on M2 4.7 and both answers round to 4.7 oe e.g.1 dp or 2 sf
				Total 5 marks

Question	Working	Answer	Mark	Notes
20	$\pi \times 4.8^2 \times \frac{72}{360}$ (= 14.4(76…)) oe		5	M1 for finding the area of the sector
	$\frac{1}{2} \times 4.8^2 \times \sin 72$ (= 10.9(56…) or 11) oe or $\frac{1}{2} \times 5.6(4...) \times 3.8(8...)$ oe			M1 for finding the area of the triangle (Allow use of cosine rule/sine rule/SOHCAHTOA/Pythagoras to find *AC* (5.6(427.8…)) and *OM* (3.8(8328…)) where *M* is the midpoint of *AC*)
	"14.4(76…)" – "10.9(56…)" (= 3.520…)			M1 for finding the shaded area with all figures from correct working
	"3.5(20…)" × 14 × 3 × 60 "3.5(20…)" × 2520			M1
	Award marks within the range from correct working	8870		A1 accept 8820 – 8950 from correct working
				Total 5 marks

					Edexcel averages: scores of candidates who achieved grade:								
Qn	**Skill tested**	**Mean score**	**Max score**	**Mean %**	**ALL**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**U**
1	Standard form	2.32	3	77	2.32	2.89	2.76	2.64	2.48	2.14	1.72	1.17	0.55
2	Graphs	2.32	3	77	2.32	2.82	2.67	2.58	2.53	2.27	1.73	1.29	0.54
3	Polygons	2.07	3	69	2.07	2.94	2.85	2.53	2.19	1.62	0.99	0.41	0.08
4	Probability	2.60	4	65	2.60	3.71	3.48	3.21	2.72	2.09	1.30	0.42	0.13
5	Inequalities	3.98	6	66	3.98	5.62	5.17	4.72	4.08	3.32	2.20	1.12	0.28
6	Percentages	2.74	4	69	2.74	3.78	3.52	3.14	2.79	2.21	1.71	1.01	0.34
7	Percentages	4.70	7	67	4.70	6.71	5.96	5.29	4.69	3.93	2.60	1.70	0.81
8	Measures	1.94	3	65	1.94	2.80	2.50	2.24	2.02	1.54	1.03	0.61	0.18
9	Linear equations	1.76	3	59	1.76	2.88	2.57	2.24	1.57	1.01	0.57	0.26	0.04
10	3D shapes and volume	1.69	3	56	1.69	2.82	2.54	2.18	1.63	0.95	0.29	0.10	0.01
11	Statistical measures	2.50	4	63	2.50	3.78	3.25	2.86	2.43	1.91	1.31	0.61	0.26
12	Mensuration of 2D shapes	2.29	4	57	2.29	3.78	3.26	2.72	2.17	1.50	0.66	0.16	0.09
13	Degree of accuracy	2.09	4	52	2.09	3.67	3.23	2.52	1.85	1.14	0.35	0.06	0.02
14	Trigonometry and Pythagoras'	2.28	5	46	2.28	4.27	3.45	2.87	1.74	0.95	0.40	0.06	0.00
15	Ratio and proportion	1.43	3	48	1.43	2.59	2.01	1.70	1.22	0.77	0.36	0.09	0.03
16	Probability	2.23	5	45	2.23	4.25	3.53	2.50	1.65	0.82	0.40	0.13	0.02
17	Graphs	1.37	3	46	1.37	2.75	2.24	1.35	0.97	0.48	0.18	0.05	0.03
18	Statistical measures	1.14	3	38	1.14	2.18	1.54	1.30	0.87	0.61	0.26	0.04	0.03
19	Degree of accuracy	1.32	5	26	1.32	2.93	2.01	1.42	0.68	0.41	0.06	0.03	0.01
20	Trigonometry and Pythagoras'	1.33	5	27	1.33	3.48	1.94	1.08	0.38	0.15	0.03	0.01	0.00
		44.10	**80**	**55**	**44.10**	**70.65**	**60.48**	**51.09**	**40.66**	**29.82**	**18.15**	**9.33**	**3.45**

Suggested grade boundaries

Grade	**9**	**8**	**7**	**6**	**5**	**4**	**3**
Mark	66	56	46	35	24	14	6