

Practice Tests Set 24 – Paper 2H-3H mark scheme

Qn	Working	Answer	Mark	Notes
1	$55 \times 32 (= 1760)$ or $52 \times 28 (= 1456)$ or $55 \times 32 + 52 \times 28 (= 3216)$		3	M1 for one correct product or method to find the total mark for both classes
	eg $\frac{"1760"+"1456"}{32+28}$ or $\frac{3216}{60}$			M1 for a complete method
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	53.6		A1
				Total 3 marks

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Qn	Working	Answer	Mark	Notes	
2 (a)	for 0.04×2000 oe (= 80) or 1.04×2000 oe (= 2080)	OR 2000×1.04^3 oe		3	M1 for finding 4% or 104% of 2000
	M1 for completing method to find total amount in the account at the end of 3 years				
	$1.04 \times "2080"$ oe (= 2163.2) $1.04 \times "2163.2"$ oe				OR M2 for 2000×1.04^3 oe or 2000×1.04^4 oe (= 2339.72)
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>		2250	A1 accept 2249 – 2250	
					SC: if no other marks gained award M1 for 0.12×2000 oe or 240 or 1.12×2000 oe or 2240 accept $(1 + 0.04)$ as equivalent to 1.04 throughout
(b)	eg $1365 \div (1 - 0.09)$ or $1365 \div 0.91$			3	M2 for a complete method (M1) for $1365 \div (100 - 9)$ (= 15) or $(100 - 9)\% = 1365$ or $91\% = 1365$ or eg $(1 - 0.09)T = 1365$ or eg $T - 0.09T = 1365$
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>		1500	A1	
					Total 6 marks

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Qn	Working	Answer	Mark	Notes
3	$1600 \times 0.16 (= 256)$ oe or $1 - 0.16 (= 0.84)$ oe		4	M1
	$1600 - "256"$ or $1600 \times "0.84"$ (= 1344)			M1
	$\frac{"1344"}{1400} (= 0.96)$ or $\frac{1400 - "1344"}{1400} (= 0.04)$ or $\frac{"1344"}{1400} \times 100 (= 96)$ or $\frac{1400 - "1344"}{1400} \times 100$			M1
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	4		A1 SCB1 for 1856 seen if no other marks awarded
				Total 4 marks

Qn	Working	Answer	Mark	Notes
4	eg $\pi \times 3^2 \times 7$ (= 63π or 197.9...)		3	M1 for method to find the volume of Solid A
	eg $\frac{2000}{[\text{vol A}]}$ or $\frac{3375}{450}$ (= 7.5 oe) or $\frac{2000 + 3375}{[\text{vol A}] + 450}$			M1 (indep) for method to find the density of Solid A, B or C, allow use of their volume for Solids A and C
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	8.3		A1 accept 8.29 – 8.31
				Total 3 marks

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Qn	Working	Answer	Mark	Notes												
5 (a)	$2 \times 2 \times 2 \times 5 \times 5$ or 2, 2, 2, 5, 5 or $2 \times 2 \times 3 \times 5 \times 7$ or 2, 2, 3, 5, 7 or eg <table border="1" style="margin-left: 20px;"> <tr><td>2</td><td>200</td><td>420</td></tr> <tr><td>2</td><td>100</td><td>210</td></tr> <tr><td>5</td><td>50</td><td>105</td></tr> <tr><td></td><td>10</td><td>21</td></tr> </table>	2	200	420	2	100	210	5	50	105		10	21		2	M1 for one number written as a product of prime factors or prime factors listed – numbers may be at end of factor trees or on ‘ladder diagrams’ or in a table or in a Venn diagram or at least two factors for each (excluding 1, 200, 420)
2	200	420														
2	100	210														
5	50	105														
	10	21														
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	20		A1 or $2^2 \times 5$ oe												
(b)			2	M1 for $2^m \times 3^n \times 5^p \times 7^q \times 11^r$ with at least three of $m = 3, n = 2, p = 2, q = 2, r = 1$ (all 5 terms should be seen) or omission of one term with others fully correct OR prime factors seen in a Venn diagram – if so must be fully correct												
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	$2^3 \times 3^2 \times 5^2 \times 7^2 \times 11$		A1 allow 970 200 oe												
				Total 4 marks												

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Qn	Working	Answer	Mark	Notes	
6	$390 \div (8 - 2) (= 65)$ or $\frac{8}{15} - \frac{2}{15} = 390$ or $\frac{8}{15}x - \frac{2}{15}x = 390$ or $\frac{6}{15} = 390$ or $\frac{6}{15}x = 390$ oe		3	M1	M2 for $\frac{390 \times 15}{6}$ oe
	“65” $\times (2 + 5 + 8)$ oe or $\frac{1}{15} = 65$ or $\frac{1}{15}x = 65$ or $\frac{1}{5} = 195$ or $\frac{1}{5}x = 195$			M1	or for 975 seen with further work and a different answer
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	975		A1	SCB1 for 52, 130, 208 or 390, 975, 1560 (or 2925) or 97.5, 243.75, 390 (or 731.25)
					Total 3 marks

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Qn	Working	Answer	Mark	Notes
7 (a)		$48 < S \leq 54$	1	B1 Allow 48 – 54 oe
(b)	$(33 \times 4) + (39 \times 14) + (45 \times 18) + (51 \times 19) + (57 \times 5)$ or $132 + 546 + 810 + 969 + 285 (= 2742)$ [lower bound products are: 120, 504, 756, 912, 270] [upper bound products are: 144, 588, 864, 1026, 300]		4	M2 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
	$\frac{"2742"}{60}$			M1 dep on M1 Allow division by their Σf provided addition or total under column seen
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	45.7		A1oe $45\frac{7}{10}$ or $\frac{457}{10}$ (accept 46 from correct working)
				Total 5 marks

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Qn	Working	Answer	Mark	Notes
8	eg $\frac{x+7}{80} = \frac{1}{4}$ or $4(x+7) = 80$ or $x+7 = 20$		4	M1 for setting up a correct equation in terms of x only
	eg $x = 80 \times \frac{1}{4} - 7 (=13)$ or $4x + 28 = 80$ and $x = \frac{80-28}{4} (=13)$ or $x = 13$			M1 for a complete method to find the value of x or $x = 13$. Award of this mark implies M2.
	eg $80 - ("13" + 7 + "13" - 11 + 3 \times "13") (=19)$ or $\frac{"13" + 7 + "13" - 11 + 3 \times "13"}{80} \left(= \frac{61}{80} \right)$			M1 for a method to find the number of yellow counters or P(R or B or G)
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	$\frac{19}{80}$		A1 oe eg accept 0.2375 or 23.75% or 0.237 or 23.7% or 0.238 or 23.8% or 0.24 or 24%
				Total 4 marks

Qn	Working	Answer	Mark	Notes
9			3	M1 For area of 2 different faces (ie not 2 triangles)
	$0.5 \times 4.8 \times 3.6 (= 8.64)$ oe or 4.8×3.6 if clear intention for this to be 2 triangles $7 \times 3.6 (= 25.2)$ $7 \times 4.8 (= 33.6)$ $7 \times 6 (= 42)$ (all measurements with intention to add)			M1 For adding together 5 areas , at least 4 of which are correct NB: $(3.6 + 4.8 + 6) \times 7 (= 100.8)$ is 3 faces
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	118		A1 118.1 or 118.08
				Total 3 marks

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Qn	Working	Answer		Mark
10	$\frac{1}{2} \times 7 \times h = 42$ oe or $(h =) \frac{42 \times 2}{7} (= 12)$ oe or $3.5^2 + h^2 = y^2$ or $h = \sqrt{y^2 - 3.5^2}$ oe		4	M1 A correct equation involving the height or a correct expression for height – could be in terms of y
	$y^2 = \left(\frac{7}{2}\right)^2 + ("12")^2$ oe or $\frac{1}{2} \times 7 \times "\sqrt{y^2 - 3.5^2}" = 42$ oe			M1 (indep) use of <i>their</i> height (any found value that they have called ‘height’)
	$y = \sqrt{\left(\frac{7}{2}\right)^2 + ("12")^2}$ oe			M1 all values must come from a correct method
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	12.5		A1 oe eg $\frac{25}{2}$
				Total 4 marks

Practice Tests Set 24 – Paper 2H-3H mark scheme

Qn	Working	Answer	Mark	Notes
11 (a)		7, 17, 32, 64, 80	1	B1 values seen in table
(b)			2	M1ft for at least 4 points plotted correctly at end of interval or for all points plotted consistently within each interval of the associated frequency table (eg at 5, 15, 25, 35, 45 or 0, 10, 20, 30, 40) at the correct height. ft their table dep on one error only in the table
	(NB: a ‘bar chart’ type graph scores zero marks)	correct cf graph		A1 All points plotted correctly at end of interval (tolerance 1 small square – there is an overlay) and joined with a curve or line segments accept curve that is not joined at (0, 0).
(c)	<i>Accept a single value in the range OR ft their cf graph</i>	33	1	B1ft Accept a single value in range 32 – 34 or ft their cf graph
(d)	NB: readings are 21 - 23 and 37 - 39 (but for this M1 these do not have to be correct if correct working is shown – eg lines or marks indicating use of CF 20 (or 20.25) and CF 60 (or 60.75) with an indication on the Time axis at the correct points (or they can just show the correct readings))		2	M1ft For correct use of LQ and UQ and subtraction, ft from a cum freq graph provided method is shown – eg a line horizontally to the graph from readings of CF 20 and CF 60 to meet the graph and then a vertical line to the Time axis (even if wrongly read scale) or clear marks on the graph and Time axis that correspond to the correct readings or correct values from the Time axis
	<i>Accept a single value in the range OR ft their cf graph</i>	16		A1ft Accept a single value in range 15 to 17 or ft from their cumulative frequency graph provided method is shown eg subtraction of values that would be correct for their graph
				Total 6 marks

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Qn	Working	Answer	Mark	Notes
12	$\frac{0.515}{6.25}$		2	M1 For either bound correct (used or seen)
	<i>Working required</i>	0.0824		A1 dep on M1 Allow $\frac{103}{1250}$
				Total 2 marks

Qn	Working	Answer	Mark	Notes
13		Fully correct angle bisector with all relevant arcs shown	2	B2 for a fully correct angle bisector with all relevant arcs shown If not B2 then B1 for all arcs and no angle bisector drawn or for a correct angle bisector within the guidelines but no correct arcs or insufficient correct arcs
				Total 2 marks

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Qn	Working	Answer	Mark	Notes	
14	$SCD = 128^\circ$ or $BCS = 32^\circ$ or $TSC = 180 - 128 (= 52)$		4	M1 angles need to be identified or may be seen marked on the diagram	M2 for $(BCD =) 128 + 32 (= 160)$ or $(DCV =) 52 - 32 (= 20)$ (may be seen marked on the diagram). To award these marks 160 or 20 must be clearly used or identified as the interior or exterior angle.
	eg (int $\angle =$) $128 + 32 (= 160)$ or (ext $\angle =$) $180 - (128 + 32) (= 20)$ or (ext $\angle =$) "52" $- 32 (= 20)$			M1 (dep on previous M1) for method to find the size of one interior or exterior angle, may be seen marked on the diagram.	
	eg $180(n - 2) = "160"n$ or $360 \div "20"$			M1 for setting up an equation for the sum of interior angles or $360 \div "20"$	
	<i>Working required</i>	18		A1 dep on M2	
				Total 4 marks	

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Qn	Working	Answer	Mark	Notes
15	$(AD =) \frac{2.2}{\tan 18}$ (= 6.77...) or $(EA =) \frac{2.2}{\sin 18}$ (= 7.11...)		4	M1 a correct method to find AD or AE
	$(DB =) \sqrt{("6.77..."^2 + 6^2}$ (= 9.04...) or $(EB =) \sqrt{6^2 + "7.11..."^2}$ (= 9.31...) or $(EB =) \sqrt{6^2 + "6.77..."^2 + 2.2^2}$ (= 9.31...)			M1 a correct method to find DB or EB
	$\tan DBE = \frac{2.2}{"9.04..."}$ or $\sin DBE = \frac{2.2}{"9.31..."}$ or $\sin DBE = \frac{2.2 \sin 90}{"9.31..."}$ $\cos DBE = \frac{"9.04..."}{"9.31..."}$ or use of cosine rule			M1 complete method to find one of $\tan DBE$ or $\sin DBE$ or $\cos DBE$ – NB: if using cosine, the student will need to have found DB and EB previously
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	13.7		A1 Allow answers in range 13.59 – 13.8
				Total 4 marks

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Qn	Working	Answer	Mark	Notes
16	eg $1.2 \times 0.65 (= 0.78)$ or $1.2L \times 0.65W (= 0.78LW)$ or $1.2 \times 0.65 \times 100 (= 78)$ or $1.2L \times 0.65W \times 100 (= 78LW)$		3	M1 allow use of other variables to L and W as long as clearly labelled as length and width allow $(1 + 0.2)$ as their 1.2 and $(1 - 0.35)$ as their 0.65
	eg $(1 - "0.78") \times 100$ or $(LW - "0.78LW") \times 100 (= 22LW)$ or $100 - "78"$ or $100LW - "78LW" (= 22LW)$			M1 method to find the percentage reduction, allow the subtraction to be written the other way around eg "78" - 100
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	22		A1 allow -22
				Total 3 marks

ALTERNATIVE Q16 mark scheme (using values for L and W)

Qn	Working	Answer	Mark	Notes
16	eg $1.2 \times x$ and $0.65 \times y$ where x and y are positive numbers		3	M1 accept any positive values for x and y allow $(1 + 0.2)$ as their 1.2 and $(1 - 0.35)$ as their 0.65
	eg $\left(1 - \frac{1.2x \times 0.65y}{xy}\right) \times 100$ or $\left(\frac{xy - 1.2x \times 0.65y}{xy}\right) \times 100$			M1 method to find the percentage reduction, allow the subtraction to be written the other way around eg $\left(\frac{1.2x \times 0.65y}{xy} - 1\right) \times 100$
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	22		A1 allow -22
				Total 3 marks

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Qn	Workking	Answer		Mark
17	$12 = \frac{1}{2} \times 4.6 \times 8.3 \times \sin ABC$ or $\frac{4.6h}{2} = 12$ ($h = 5.217\dots$)		5	M1 a correct equation for the area to find angle ABC or to find the perpendicular height of the triangle.
	$ABC = \sin^{-1} \left(\frac{12}{\frac{1}{2} \times 4.6 \times 8.3} \right)$ (= 38.947...) oe or $ABC = \sin^{-1}(0.6286)$ (= 38.947...) or $ABC = \sin^{-1} \left(\frac{"5.217\dots"}{8.3} \right)$ (= 38.947...) or $BM^2 = 8.3^2 - "5.217\dots"^2$			M1 A correct method to find angle ABC or a correct method to find BM^2 where CMB is 90°
	$AC^2 = 4.6^2 + 8.3^2 - 2 \times 4.6 \times 8.3 \times \cos("38.947")$ [allow $\cos 39^\circ$] or $AC^2 = 30.6(627\dots)$ $BM = \sqrt{8.3^2 - "5.217\dots"^2}$ (=6.455...)			M1 a correct start to the cosine rule to find length AC or a fully correct method for BM
	or $AC = \sqrt{"30.6(6\dots)"}$ or 5.5(3739...)			A1 A correct value for AC which can be the square root of 30.6(6...)
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	18.4		A1 Allow answers in range 18.4 to 18.45
				Total 5 marks

Practice Tests Set 24 – Paper 2H-3H mark scheme

Qn	Working	Answer	Mark	Notes
18 (a)	$15 \div 15 (= 1)$ $18 \div 5 (= 3.6)$ $32 \div 20 (= 1.6)$ $4 \div 10 (= 0.4)$	Correct histogram	3	<p>B3 for a fully correct histogram</p> <p>If not B3 then B2 for 3 correct frequency densities (can be implied by heights) or 3 correct bars drawn</p> <p>If not B2 then B1 for 2 correctly calculated frequency densities (can be implied by heights) or 2 correct bars drawn</p>
				<p>SC: award B2 for all 4 bars of correct width with heights in the correct ratio (eg drawn at 0.5, 1.8, 0.8, 0.2)</p> <p>SC: award B1 for 3 bars of correct width with heights in the correct ratio</p>
(b)	eg $\frac{15}{20} \times 32 (= 24)$ or $\frac{5}{20} \times 32 (= 8)$ or $\frac{15}{20} \times 32 + 18 (= 42)$ or $32 + 18 - \frac{5}{20} \times 32 (= 42)$		2	<p>M1 for a method to find an estimate for the number of students who took between 30 and 45 minutes or between 45 and 50 minutes or between 25 and 45 minutes</p> <p>ft incorrect histogram</p>
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	$\frac{42}{50}$		A1 oe eg $\frac{21}{25}$, 0.84, 84%
				Total 5 marks

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Qn	Working	Answer	Mark	Notes
19	$\sqrt{\frac{3600}{625}}$ or $\frac{12}{5}$ oe or 2.4 or 12:5 oe or $\sqrt{\frac{625}{3600}}$ or $\frac{5}{12}$ oe or 0.416... or 5:12 oe or $\frac{3600^3}{625^3} = \frac{(\text{vol of statue})^2}{750^2}$ oe or $\frac{3600}{625} = \frac{(\text{vol of statue})^{\frac{2}{3}}}{750^{\frac{2}{3}}}$ oe		3	M1 for a correct length scale factor or a correct length ratio or setting up a correct equation involving the volume of the statue
	eg $750 \times \left(\frac{12}{5}\right)^3$ oe or $750 \div \left(\frac{5}{12}\right)^3$ oe or $\sqrt{\frac{3600^3 \times 750^2}{625^3}}$ oe or $\left(\frac{3600 \times 750^{\frac{2}{3}}}{625}\right)^{\frac{3}{2}}$ oe			M1 (dep on M1) for a correct method to work out the volume of the statue
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	10 368		A1 cao
				Total 3 marks

Practice Tests Set 24 – Paper 2H-3H mark scheme

Qn	Working	Answer	Mark	Notes
20 (a)	11 – 2		2	M1 2 and 11 clearly identified either in list or stated
	<i>Working required</i>	9		A1 dep on M1
(b) (i)		Kim as she has a higher median	1	B1 oe, ft their median if value given Acceptable examples Kim as she has a higher median Kim as/because her median is 11 and/but/whereas Rutger’s is 8 Kim’s median is 3 more (than Rutger’s) Kim as Rutger’s median is 3 less Not acceptable examples Kim’s median is 11 and Rutger’s is 8 Kim as she has a higher median and a lower IQR
(ii)		Kim as she has a smaller IQR	1	B1 oe, ft their part (a) Acceptable examples Kim as she has a smaller IQR Kim as/because her IQR is 5 and/but/whereas Rutger’s is 9 Kim’s IQR is 4 less (than Rutger’s) Kim as Rutger’s IQR is 4 more Not acceptable examples Kim’s IQR is 5 and Rutger’s is 9 Kim as she has a higher median and a lower IQR
				Total 4 marks

Practice Tests Set 24 – Paper 2H-3H mark scheme

Qn	Working	Answer	Mark	Notes
21	$(\angle AOC =) 132 \times 2 (= 264)$		3	M1 for method to find angle at the centre. Do not award this mark if contradicted on the diagram eg if obtuse AOC is labelled as 264
	eg $\frac{"264"}{360} \times 2 \times \pi \times 8.5 (= 39.1... \text{ or } \frac{187}{15} \pi)$ or $2 \times \pi \times 8.5 - \frac{360 - "264"}{360} \times 2 \times \pi \times 8.5 (= 39.1... \text{ or } \frac{187}{15} \pi)$ or $\frac{"264"}{360} \times 2 \times \pi \times 8.5 + 2 \times 8.5$ or $2 \times \pi \times 8.5 - \frac{360 - "264"}{360} \times 2 \times \pi \times 8.5 + 2 \times 8.5$			M1 for a method to find the length of arc AC or perimeter of the sector – allow use of their AOC as long as clearly labelled
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	56.2		A1 accept 56.1 – 56.2
				Total 3 marks

Practice Tests Set 24 – Paper 2H-3H mark scheme

Qn	Skill tested	Mean score	Max score	Mean %	Edexcel averages: scores of candidates who achieved grade:								
					ALL	9	8	7	6	5	4	3	U
1	Statistical measures	2.35	3	78	2.35	2.97	2.84	2.68	2.41	1.61	0.91	0.23	0.07
2	Percentages	4.78	6	80	4.78	5.91	5.55	5.32	4.80	3.61	2.43	1.16	0.40
3	Percentages	3.16	4	79	3.16	3.83	3.65	3.35	2.87	2.60	2.16	1.60	0.63
4	Measures	2.25	3	75	2.25	2.89	2.64	2.51	2.17	1.53	1.04	0.64	0.19
5	Powers and roots	2.88	4	72	2.88	3.78	3.38	3.03	2.42	1.99	1.47	0.00	0.00
6	Ratio and proportion	2.18	3	73	2.18	2.96	2.68	2.23	2.04	1.50	0.87	0.31	0.10
7	Statistical measures	3.36	5	67	3.36	4.71	4.26	3.63	2.62	1.85	1.23	0.00	0.00
8	Probability	2.74	4	69	2.74	3.81	3.49	2.87	2.41	1.47	0.96	0.36	0.09
9	3D shapes and volume	2.07	3	69	2.07	2.75	2.53	2.14	1.95	1.35	0.98	0.34	0.28
10	Trigonometry and Pythagoras' Theorem	2.62	4	66	2.62	3.59	3.08	2.79	2.44	1.61	1.23	0.62	0.24
11	Graphical representation of data	4.06	6	68	4.06	5.64	4.96	4.15	3.14	2.74	1.83	0.00	0.00
12	Degree of accuracy	1.22	2	61	1.22	1.87	1.66	1.23	0.88	0.55	0.19	0.08	0.02
13	Construction	1.19	2	60	1.19	1.76	1.38	1.20	0.96	0.71	0.43	0.16	0.01
14	Angles, lines and triangles	2.35	4	59	2.35	3.78	3.00	2.22	1.54	0.93	0.52	0.19	0.03
15	3D shapes and volume	2.24	4	56	2.24	3.81	3.14	2.21	1.12	0.60	0.12	0.03	0.06
16	Percentages	1.51	3	50	1.51	2.43	1.84	1.63	1.03	0.56	0.16	0.01	0.00
17	Mensuration of 2D shapes	2.54	5	51	2.54	4.38	3.44	2.45	1.39	0.54	0.27	0.12	0.02
18	Graphical representation of data	2.60	5	52	2.60	4.28	3.38	2.33	1.49	0.99	0.58	0.00	0.00
19	Similarity	1.55	3	52	1.55	2.74	2.18	1.30	0.78	0.30	0.07	0.04	0.00
20	Statistical measures	1.95	4	49	1.95	3.27	2.43	1.66	1.17	0.91	0.41	0.00	0.00
21	Mensuration of 2D shapes	1.17	3	39	1.17	2.13	1.42	1.03	0.58	0.36	0.05	0.03	0.01
	TOTAL	50.77	80	63	50.77	73.29	62.93	51.96	40.21	28.31	17.91	5.92	2.15

Suggested grade boundaries

Grade	9	8	7	6	5	4	3
Mark	68	57	46	34	23	18	4