

Qn	Working	Answer	Mark	Notes
1	$8.5^2 + 5.6^2 (= 103.61)$		3	M1
	$\sqrt{8.5^2 + 5.6^2}$			M1
		10.2		A1 Accept 10.1 to 10.2 or better
				Total 3 marks

2	3 hours 36 mins = 216 (mins) or 3.6 (hours) $\frac{36}{60}$ oe (hours)		3	M1
	$2470 \div 3.6$ or $2470 \div 3 \frac{36}{60}$ or $2470 \div 216 \times 60$			M1 Allow $2470 \div 3.36 (=735$ or better)
		686		A1 Accept 686.1 or better
				Total 3 marks

3	$30 = \frac{27}{1.2x}$		3	M1 Or for $\frac{27}{30} (= 0.9)$
	$1.2x = \frac{27}{30}$ or $36x = 27$ or $22.5 \div 30$			M1
		0.75 oe		A1
				Total 3 marks

4	$0.4 \times 75 (= 30)$ oe		4	M1 M2 for $0.6 \times 75 (= 45)$ oe
	$75 - 30 (= 45)$			M1
	(T-Shirt =) $\frac{45 - 12}{2}$ or (Bag =) $\frac{45 + 12}{2}$ oe or $t + (t + 12) = 45$ oe			M1 (T-shirt = £16.50)
		28.5(0)		A1
				Total 4 marks

5	e.g. ($EF =$) $12\cos 40$ ($= 9.19\dots$) or ($FD =$) $12\sin 40$ ($= 7.71\dots$) and ($EF =$) $\sqrt{12^2 - "7.71"}^2$ ($= 9.19\dots$)			M2 complete method to find EF (if not M2 then M1 for a correct statement involving EF e.g. $\frac{EF}{12} = \cos 40$)
	e.g. $\frac{"9.19"}{EG} = \tan 28$ or $\tan 62 = \frac{EG}{"19.9"}$ or $\frac{"9.19"}{FG} = \sin 28$ ($= 19.5\dots$) and $"19.5" - "9.19" = 298.9\dots$			M1 (dep on M2) for a correct trig statement involving EG or complete method to find FG and a correct start to Pythagoras process
		17.3	4	A1 accept 17.2 – 17.3
Total 4 marks				

6	$20\,000 \times 0.813$ oe			M2 M1 for $20\,000 \times 0.81$ oe ($= 16\,200$) or $20\,000 \times 1.19$ oe ($= 23\,800$) or $20\,000 \times 1.193$ oe ($= 33\,703.18$)
		10 629		A1 Accept 10 628 \rightarrow 10 629
Total 3 marks				

7	$\pi \times 7.2^2 \div 2$ ($= 81.4\dots$)			M1 allow 81.3 – 81.5 for area of semi circle
	"81.4" $\div 6$ ($= 13.5\dots$) or 12×6 ($= 72$) or "81.4" $\div 12$ ($= 6.7\dots$)			M1 (dep) allow 13.5 – 13.6 for the number of boxes needed (NB: $12 \times 6 = 72$ alone is 0 marks)
		No with correct figures	3	A1
Total 3 marks				

8	(a)		3.74×10^7	2	B2 B1 for 37 400 000 (oe but not in standard form) or 3.74×10^n ($n \neq 7$) or 3.7×10^7 or 3.8×10^7
	(b)		11	1	B1 Allow 11 \rightarrow 11.1
					Total 3 marks

9	28×5 (= 140) OR 26.5×2 (= 53)				M1 or 87
	$(28 \times 5 - 26.5 \times 2) \div (5 - 2)$				M1 for a complete method
			29	3	A1
					Total 3 marks

10	$10 \times 5 + 30 \times 11 + 50 \times 8 + 70 \times 19 + 90 \times 9$ $(50 + 330 + 400 + 1330 + 810)$		3	M2 Correct products using midpoints (allowing one error) with intention to add. M1 for products using frequency and a consistent value within the range (allowing one error) with intention to add. or correct products using midpoints without addition (allow 1 error)
		2920		A1 N.B. $2920 \div 52$ (=56.2..) scores M2A0
				Total 3 marks

11	$20.40 \div (1 - 0.15)$			M2 for a complete method eg $20.40 \div (1 - 0.15)$ for $20.40 \div (100 - 15) (= 0.24)$ (M1) or e.g. $0.85x = 20.40$
		24	3	A1
				Total 3 marks

12	$\frac{h}{2} \times (7+12) \times 10 = 608$ oe		3	M2 $\frac{h}{2} \times (7 + 12) \times 10$ M1 for $\frac{h}{2} \times (7 + 12) \times 10$
		6.4		A1
				Total 3 marks

13 (a)	$\frac{2(4-3x)}{10} - \frac{5(3x-5)}{10} = -3$ eg oe or $2(4-3x) - 5(3x-5) = -3 \times 2 \times 5$		3	M1 Correct fractions over common denominator as an equation or Multiplying both sides by 10
	$8 - 6x - 15x + 25 = -30$ oe			M1 A correct equation with no denominators or brackets
		3		A1 dep on M1
(b)	$(5y + 8)(y - 5) (\leq 0)$ $\frac{- -17 \pm \sqrt{(-17)^2 - 4 \times 5 \times -40}}{2 \times 5}$ or (y =)		3	M1 Correct method to solve 3 term quadratic – factorising or correct use of formula
	-1.6, 5 oe			A1 Correct critical values
		$-1.6 \leq y \leq 5$ oe		A1 Condone change of variable in place of y throughout this question.
				Total 6 marks

14	$1.5 \times 2 \times 8 (= 24 \text{ (cm}^3\text{)})$			M1	for finding the volume of the cuboid
	e.g. $(V =) \frac{5.73 \times 1000}{19.32} (= 296.58\dots)$ or $(M =) 19.32 \times "24" (= 463.68)$			M2	complete method to find the volume of statue or the mass of one block, could work in g or kg (if not M2 then award M1 for correct use of density formula e.g. $19.32 = \frac{5.73 \times 1000}{V}$ or $19.32 = \frac{M}{"24"}$)
	e.g. $"296.58" \div "24" (= 12.3576\dots)$ or $"5730" \div "463.68" (= 12.3576\dots)$			M1	could work in g or kg
		13	5	A1	cao
				Total 5 marks	

15	$0.42 \div 0.6 (= 0.7)$ oe			M1	(indep)
	$1 - "0.7" (= 0.3)$ oe OR $1 - 0.6 (= 0.4)$ oe			M1	(indep)
	$"0.3" \times "0.4"$ oe OR $1 - (0.42 + 0.6 \times "0.3" + "0.4" \times "0.7")$ oe			M1	for a complete method
		0.12	4	A1	oe
				Total 4 marks	

16	$180 - 2 \times 66 (= 48)$ $(360 - \text{"48"}) \div 2 (= 156)$ $180 - \text{"156"} (= 24)$ $360 \div \text{"24"}$		3	M1 Could be marked on diagram M1ft Final stage of calculation
	Alt : $180 - 2 \times 66 (= 48)$ $360 \div (0.5 \times \text{"48"})$			M1 Could be marked on diagram M1ft Final stage of calculation
	Alt: $180 - 2 \times 66 (= 48)$ $(360 - \text{"48"}) \div 2 (= 156)$ $\frac{180(n-2)}{n} = \text{"156"}$ $\frac{180(15-2)}{15} (= 156)$ $\text{"24"}n = 360$ or $\frac{180(15-2)}{15} (= 156)$			M1 Could be marked on diagram M1ft Final stage of calculation or embedded correct answer.
		15		A1
				Total 3 marks

17	e.g. $x = 0.57272\dots$ and $100x = 57.272\dots$ OR e.g. $10x = 5.7272\dots$ and $1000x = 572.72\dots$			M1 For 2 recurring decimals with correct algebraic labels that when subtracted give a whole number or terminating decimal eg 56.7 or 567 etc e.g. $100x = 57.272\dots$ and $x = 0.57272\dots$ OR $1000x = 572.72\dots$ and $10x = 5.7272\dots$ with intention to subtract. (If recurring dots not shown then showing at least the digits 57272, ie 5sf)
	e.g. $100x - x = 57.272\dots - 0.57272\dots = 56.7$ and $\frac{56.7}{99} = \frac{63}{110}$ or $1000x - 10x = 572.72\dots - 5.7272\dots = 567$ and $\frac{567}{990} = \frac{63}{110}$	Shown	2	A1 for completion to $\frac{63}{110}$
				Total 2 marks

18 (a)		$\frac{3}{10}, \frac{7}{12}, \frac{5}{12}, \frac{7}{12}, \frac{5}{12}$	2	B2 $\frac{3}{10}$ B1 for $\frac{3}{10}$ oe B1 for all other correct probabilities 2d.p truncated or rounded (e.g 0.58 or 0.41 or 0.42)
(b)	$\frac{7}{10} \times \frac{5}{12}$ or $\frac{3}{10} \times \frac{7}{12}$ oe		3	M1ft
	$\frac{7}{10} \times \frac{5}{12} + \frac{3}{10} \times \frac{7}{12}$ oe			M1ft
		$\frac{56}{120}$ oe		A1 $\frac{7}{15}$ eg $\frac{7}{15}$ or 0.46...(2 dp truncated or rounded)
(c)	$\frac{3}{10} \times \frac{5}{12} \times x = \frac{3}{100}$ oe		3	M1ft A correct equation involving the unknown probability
	$x = \frac{3}{100} \div \frac{15}{120} (= \frac{6}{25})$ oe			M1ft Isolating or calculating the value of x
		25		A1 Dep on M1
				Total 8 marks

19	eg $5 \times 2x + 10 \times x = 160$ OR $160 \div 2 (= 80)$ [freq of one bar] OR $40 \times 5 + 20 \times 10 (= 400)$ [total no. of sml squares] OR $160 \div 16 (= 10)$ [students per 1cm^2] OR $1\text{cm}^2 = 10$ students OR e.g. 5 small squares = 2 students oe			M1 for setting up an appropriate equation OR finding the area of the 2 nd or 3 rd bar OR finding the total number of small squares OR for finding the number of students per 1cm^2 or $1\text{cm}^2 = 10$ students OR other appropriate scale e.g. 5 small squares = 2 students
	‘x’ = 8 OR 8 or 16 seen in the correct position on the vertical scale OR $160 \div \text{“400”} (= 0.4 \text{ oe})$			M1 for finding frequency density OR method to find the frequency of the 1 st , 4 th or 5 th bar (1 st is 108, 4 th is 90, 5 th is 12)
	“7.2” $\times 15 + 160 + \text{“6”} \times 15 + \text{“2.4”} \times 5$ OR $160 + \text{“0.4”} \times (18 \times 15 + 15 \times 15 + 5 \times 6)$			M1 (dep on at least M1) for a complete method to find the total frequency (allow one error or one repeat but no omission)
		370	4	A1
				Total 4 marks

20	$(ASF =) \frac{13^2}{9^2}$ or $\frac{9^2}{13^2}$		4	M1 Correct SF for area. Accept 1.442 (= 2.07 or 2.09) or better for ASF or 0.692 (= 0.47 or 0.48) or better for ASF
	eg A + “(13) ² /9 ²) ” A = 1800			M1ft Dep on previous M1
	eg “ $\frac{250}{81}$ ” A = 1800			M1ft
		583.2		A1 Awrt 583
				Total 4 marks

21	$CB = 13 \sin 40$ (= 8.3562...)			M1
	$\frac{1}{2} \times 6 \times "8.35..." \times \sin ACB = 22$			M1
	Acute version of $ACB = \sin^{-1} \left(\frac{22}{\frac{1}{2} \times 6 \times "8.35..." } \right)$ (= 61.35...)			M1
	$ACB = 180 - "61.353..."$ (= 118.647...)			M1
	$AB^2 = 6^2 + "8.35..."^2 - 2 \times 6 \times "8.35..." \times \cos "118.64"$ (= 153.98...)			M1
		12.4	6	A1 accept 12.3 – 12.5
				Total 6 marks

Qn	Paper	Question	Skill tested	Max score	Mean %	Edexcel averages: scores of candidates who achieved grade:							
						ALL	9	8	7	6	5	4	3
1	2HR	Q04	Trigonometry and Pythagoras' Theorem	3	92	2.76	2.99	2.98	2.92	2.90	2.60	2.29	2.03
2	2HR	Q05	Measures	3	88	2.65	2.99	2.91	2.90	2.67	2.42	1.92	1.28
3	2HR	Q09	Measures	3	83	2.48	2.97	2.86	2.78	2.39	1.76	1.12	0.94
4	2FR	Q13	Applying Number	4	88	3.50	4.00	3.80	3.65	3.50	3.39	2.32	2.19
5	1HR	Q15	Trigonometry and Pythagoras' Theorem	4	79	3.15	3.89	3.70	3.60	2.89	2.06	1.14	0.53
6	2HR	Q08	Percentages	3	87	2.62	2.97	2.90	2.69	2.55	2.34	2.01	1.42
7	1HR	Q05	Mensuration of 2D shapes	3	80	2.39	2.90	2.75	2.65	2.23	2.00	1.01	0.69
8	2HR	Q10	Standard form	3	84	2.52	2.93	2.78	2.62	2.47	2.03	1.64	1.59
9	1HR	Q08	Statistical measures	3	78	2.35	2.95	2.83	2.42	2.21	1.50	0.65	0.58
10	2HR	Q02	Statistical measures	3	78	2.34	2.85	2.71	2.38	2.09	1.52	1.40	1.11
11	1HR	Q07	Percentages	3	75	2.26	2.96	2.78	2.28	1.81	1.19	0.72	0.42
12	2HR	Q13	3D shapes and volume	3	72	2.16	2.90	2.73	2.22	1.94	0.96	0.15	0.08
13	2HR	Q19	Inequalities	6	63	3.80	5.56	4.65	3.80	2.64	1.82	1.06	0.39
14	1HR	Q09	Measures	5	66	3.29	4.66	4.07	3.10	2.29	1.61	0.83	0.50
15	1HR	Q16	Probability	4	67	2.66	3.77	3.44	2.46	1.78	1.02	0.63	0.53
16	2HR	Q12	Polygons	3	66	1.98	2.91	2.48	1.70	1.15	0.84	0.36	0.39
17	1HR	Q13a	Decimals	2	57	1.15	1.76	1.43	1.08	0.47	0.44	0.26	0.08
18	2HR	Q16	Probability	8	57	4.53	7.11	5.33	3.75	2.67	1.88	1.54	1.22
19	1HR	Q19	Graphical representation of data	4	54	2.15	3.44	2.72	1.52	1.11	0.53	0.18	0.14
20	2HR	Q20	Similarity	4	45	1.81	3.52	2.10	0.82	0.50	0.12	0.10	0.03
21	1HR	Q21	Trigonometry and Pythagoras' Theorem	6	25	1.48	3.13	1.60	0.72	0.41	0.28	0.05	0.03
				80	68	54.03	73.16	63.55	52.06	42.67	32.31	21.38	16.17

Suggested grade boundaries

Grade	9	8	7	6	5	4	3
Mark	68	58	47	37	26	19	15