Practice Tests (Set 21) – 2H–3H

Q	Working	Answer		Mark	Notes
1	For use of 5 hrs 24 mins = 5.4 hrs or 324 mins		3	B1	
	3980 ÷ 5.4 or			M1	For use of distance ÷ speed (allow use of 5.24 for this mark)
		737		A1	awrt 737
					Total 3 marks

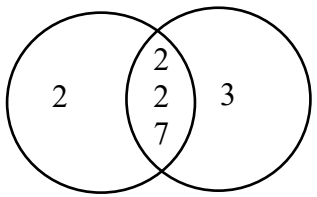
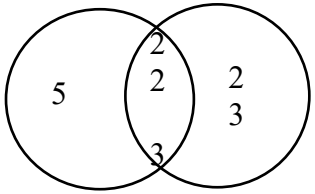
Q	Working	Answer		Mark	Notes
2	$\cos 42 = \frac{x}{9.5}$ or $9.5^2 - (9.5\sin 42)^2$ or $\tan 42 = \frac{9.5\sin 42}{x}$		3	M1	a correct trig statement for x
	$(x =)\ 9.5\cos 42$ or $(x =)\ \sqrt{9.5^2 - (9.5\sin 42)^2}$ or $(x =)\ \frac{9.5\sin 42}{\tan 42}$			M1	a fully correct method to find x
		7.06		A1	awrt 7.06
					Total 3 marks

Q	Working	Answer		Mark	Notes
3	300 ÷ (7 + 5 + 3) (= 20)		5	M1	
	$\frac{2}{5}\times(7\times"20")(=56)$			M1	
	0.36 × (5 × “20”)(=36)			M1	
	$\frac{"56"+"36"}{300}$			M1	or any correct fraction that isn’t simplified or 30.66..% or 0.3066...
		$\frac{23}{75}$		A1	
					Total 5 marks

Q	Working	Answer	Mark	Notes
4	1– (0.26 + 0.18) (= 0.56) oe or 0.28 oe or $x + x = 1 – (0.26 + 0.18)$ oe		4	M1 0.28 oe may be seen in the table
	45 ÷ 0.18 (= 250) oe or $\frac{45}{18}$ (= 2.5) oe $\frac{"0.56"}{2} \div 0.18 \left(= \frac{14}{9} = 1.55... \right)$ oe or $\frac{"56"}{2} \div 18 \left(= \frac{14}{9} = 1.55... \right)$			M1
	$"250" \times \frac{"0.56"}{2}$ oe or 2.5 × $\frac{"56"}{2}$ oe or "250"×"0.28" oe or $"0.28" \div 0.18 \times 45$ oe or $"\frac{14}{9}" \times 45$ oe or "28" ÷ 18 × 45 oe or $\frac{45}{18} \times "28"$ oe			M1
		70		A1 ($\frac{70}{250}$ scores M3A0)
				Total 4 marks

5	50 000 × 1.013 (=50 650) oe		3	M1 or an answer of 52 600	M2 for 50000×1.013^4
	"50 650" × 1.013 (=51 308.45) "51 308.45"× 1.013 (=51 975.45...) "51 975.45...× 1.013			M1	
		52 651		A1 awrt 52 651	
					Total 3 marks

Q	Working	Answer	Mark	Notes
6	28 × 12 (=336)		4	M1 For a correct method to find the area of the rectangle (may be seen as part calculation)
	28 × 12 + 0.5 × (28 – 5 – 5 + *CD*) × (20 – 12) = 434 oe eg 0.5 × (18 + *CD*) × 8 = 434 – 336			M1 A correct equation involving *CD*
	Eg "288" + 16*CD* = "196"			M1 A correct simplified (no fractions or brackets) equation for *CD*
		6.5		A1
				Total 4 marks

Q	Working	Answer	Mark	Notes
7 (a)	1, 2, 4, 7, 8, 14, 28, 56 **and** 1, 2, 3, 4, 6, 7, 12, 14, 21, 28, 42, 84 **or** 2 2 2 7 **and** 2 2 3 7 **or**  e.g. **28** | 56 | 84 **2** | **3**		2	M1 for any correct valid method and no errors e.g. for starting to list at least **four** different factors of each number and no errors **or** 2 2 2 7 **and** 2 2 3 7 seen (may be in a factor tree or a ladder diagram and ignore 1) **or** a fully correct Venn diagram **or** other clear method, e.g, table
		28		A1 dep M1 accept $2^2 \times 7$ oe
(b)	60, 120, 180, 240… **and** 72, 144, 216, 288… **or** 2 2 3 5 **and** 2 2 2 3 3 **or**  **or** $\frac{60\times72}{12}$ **or** 2, 2, 2, 3, 3, 5 oe **2** | 60 | 72 **2** | 30 | 36 **3** | 15 | 18 **2** | **5** | 6 | | **3**		2	M1 for any correct valid method and no errors e.g. for starting to list at least **four** multiples of each number **or** 2 2 3 5 **and** 2 2 2 3 3 seen (may be in a factor tree or a ladder diagram and ignore 1) **or** a fully correct Venn diagram **or** other clear method, e.g, table
		360		A1 dep M1 accept $2^3 \times 3^2 \times 5$ oe
				Total 4 marks

Q	Working	Answer	Mark	Notes
8	$7x + 3x + 8x = 360$ oe		4	M1 M2 for $7x = 140$
	$(x =)\ 360 \div 18\ (= 20)$			M1 (140 can be on diagram)
	$360 \div (180 - 7 \times$ "20") oe or $360 \div (180 -$ "140") $\frac{(n-2)\times 180}{n} = 7 \times$ "20" oe or $360 \div 40$			M1 for 360 ÷ exterior angle
		9		A1
				Total 4 marks

Q	Working	Answer	Mark	Notes
9	$7 \times 2.7\ (=18.9)$ or $4 \times 3.3\ (= 13.2)$		3	M1
	$\frac{7\times 2.7 - 4\times 3.3}{3}$ or $\frac{18.9-13.2}{3}$ or $\frac{5.7}{3}$			M1
		1.9		A1
				Total 3 marks

Q	Working	Answer	Mark	Notes
10	$\frac{3}{8}+45\%\ \left(=\frac{33}{40}\text{ or }82.5(\%)\text{or }0.825\right)$		5	M1
	$1-\frac{"33"}{40}\left(=\frac{7}{40}\right)$ **or** $100-"82.5"(\%)\left(=17.5(\%)\right)$ **or** $1-"0.825"(=0.175)$			M1
	$406\div\frac{"7"}{40}(=2320)$ **or** $406\div\frac{"17.5"}{100}$oe (= 2320) **or** 1% = 406 ÷ "17.5" (= 23.2) oe			M1
	0.45 × "2320" oe **or** 45 × "23.2" oe			M1
		1044		A1
				Total 5 marks

Q	Working	Answer	Mark	Notes
10 ALT	$\frac{3}{8}x+0.45x+406$oe		5	M1
	$\frac{3}{8}x+0.45x+406=x$oe			M1 for a correct equation
	$(x=)\frac{406}{1-\frac{3}{8}-0.45}\left(=\frac{406}{7/40}=2320\right)$			M1
	0.45 × "2320"			M1
		1044		A1
				Total 5 marks

Q	Working	Answer		Mark	Notes
11			3	M1	For one of ×1000, ÷60, ÷ 60 or for use of 3600
	$\frac{81\times1000}{60\times60}$			M1	For a fully correct method
		22.5		A1	
					Total 3 marks

Q	Working	Answer	Mark	Notes
12	$(AC^2 =)\ 9.7^2 + 12.3^2 - 2 \times 9.7 \times 12.3 \times \cos 115$		5	M1 for the correct use of cosine rule
	$(AC^2 =)\ 346(.2\ldots)$ **or** $(AC =)\ \sqrt{346(.2....)}$ or 18.6…			A1 for 346 or $\sqrt{346(.2....)}$ or 18.6…
	$\frac{\sin x}{9.7} = \frac{\sin 115}{"\sqrt{346}"}$ oe or $9.7^2 = "\sqrt{346}"^2 + 12.3^2 - 2\times"\sqrt{346}"\times12.3\times\cos x$ or $\frac{1}{2}\times9.7\times12.3\times\sin115 = \frac{1}{2}\times12.3\times"\sqrt{346}"\times\sin x$ oe			M1 use of their AC dep on first M1 for correct use of sine rule **or** cosine rule **or** for setting up an equation using the area of a triangle formula to find $\sin x$
	$\sin x = 9.7\times\frac{\sin115}{"\sqrt{346}"}$ oe or $\sin x = 0.47...$ or $\cos x = \frac{"\sqrt{346}"^2 + 12.3^2 - 9.7^2}{2\times"\sqrt{346}"\times12.3}$ or $\cos x = 0.88...$			M1 use of their AC dep on first M1 Allow $(x=)\sin^{-1}(....)$ or $(x=)\cos^{-1}(....)$
		28.2		A1 awrt
				Total 5 marks

Q	Working	Answer	Mark	Notes
13	$1.4 = \frac{72}{(\text{area})}$ oe		4	M1
	(area =) $\frac{72}{1.4}$ (= $\frac{360}{7}$ = 51.4…) oe			M1 (51.4 or better)
	"51.4…" × 18 **or** $r = \sqrt{\frac{"51.4..."}{\pi}}$ (= 4.046…) **and** $\pi \times "4.046"^2 \times 18$			M1 allow use of πr^2 to find the radius and then using $\pi r^2 h$ to find the volume
		926		A1 Allow 925 – 928
				Total 4 marks

Q	Working	Answer	Mark	Notes
14	$M = kh^3$		4	M1 $k \neq 1$
	$4 = k \times 0.5^3$ or $k = 32$ or $\frac{500}{4} = 125 = 5^3$			M1 Allow this for M2 if $M = kh^3$ is not written
	$h = \sqrt[3]{\frac{500}{"32"}}$ or $h = 5 \times 0.5$			M1 Using their value of k correctly dep on M1M1 or M2 or correct use of 5 from $500 \div 4 = 5^3$
		2.5		A1 cao
				Total 4 marks

Q	Working	Answer	Mark	Notes
15	0.5^3 or $\frac{1}{8}$ or 0.125 oe		4	M1 for finding *DDD*
	0.3×0.2^2 or $\frac{3}{250}$ or 0.012 oe			M1 for finding *WLL* in any order
	$0.5^3 + 3 \times 0.3 \times 0.2^2$ or "$\frac{1}{8}$"+"$\frac{9}{250}$"or "0.125" + 3 × "0.012" oe			M1 for a complete method
		0.161		A1 oe
				Total 4 marks

15 ALT	0.3^3 or 0.027 or 0.2^3 or 0.008 oe		4	M1 for finding *WWW* or *LLL*
	$0.3^2 \times 0.5$ or 0.045 or $0.3^2 \times 0.2$ or 0.018 or $0.5^2 \times 0.3$ or 0.075 or $0.5^2 \times 0.2$ or 0.05 or $0.2^2 \times 0.5$ or 0.02 or $0.3 \times 0.5 \times 0.2$ or 0.03 **or** $0.3^2 \times 0.7$ or 0.063 or $0.5^2 \times 0.5$ or 0.125 or $0.2^2 \times$ 0.5 or 0.02 or $0.3 \times 0.5 \times 0.2$ or 0.03			M1 for finding *WWD* or *WWL* or *WDD* or *DDL* or *DLL* or *WDL* in any order **or** for finding *WWW′* or *DDD′* or *DLL* or *WDL* in any order
	$1 – (3 \times 0.3^2 \times 0.5 + 3 \times 0.3^2 \times 0.2 + 3 \times 0.5^2 \times 0.3 + 3 \times 0.5^2 \times 0.2 + 3 \times 0.2^2 \times 0.5 + 6 \times 0.3 \times 0.5 \times 0.2)$ **or** $1 – (3 \times 0.3^2 \times 0.7 + 3 \times 0.5^2 \times 0.5 + 3 \times 0.2^2 \times 0.5 + 6 \times 0.3 \times 0.5 \times 0.2)$			M1 for a complete method
		0.161		A1 oe
				Total 4 marks

Q		Working	Answer	Mark	Notes	
16	(a)	1 + 0.04 (= 1.04) **or** 100(%) + 4(%) (= 104(%)) **or** $\frac{634\ 400}{104}$(= 6100) oe		3	M1	
		634 400 ÷ "1.04" **or** 634 400 ÷ "104" × 100 **or** 634 400 × 100 ÷ "104" oe			M1	
			No and 610 000		A1 dep on M2 for no and 610 000 seen oe E.g. Still (band) B and 610 000 oe	
	(b)	"0.85" × "0.85" (= 0.7225) oe **or** "0.85" – ("0.85" × 0.15) (= 0.7225) **or** $\frac{"85"\times"85"}{100}$(= 72.25) oe or [0.85 and 85 must come from correct working]		3	M1 allow use of their amount e.g. 200 × "0.85" × "0.85" (= 144.5)	M2 for 15 + (0.15 × "85")
		1 – "0.7225" **or** 0.2775 **or** 100 – "72.25"			M1 e.g. $\frac{200-"144.5"}{200}$(×100)	
			27.75		A1 oe allow 27.8 or 28	
						Total 6 marks

17	$580\pi = \pi \times 20 \times l$ oe		5	M1 for correct substitution into $A = \pi rl$
	$(l =)\dfrac{580\pi}{20\pi}(=29)$			M1
	$\sqrt{"29"^2 - 20^2}\ (=\sqrt{441} = 21)$			M1
	$\left(\frac{1}{2}\times\frac{4}{3}\times\pi\times 20^3\right)+\left(\frac{1}{3}\times\pi\times 20^2\times"21"\right)$ or $\frac{16\,000}{3}\pi+\frac{8400}{3}\pi$ or $\frac{16\,000}{3}\pi+2800\pi$			M1 for a complete method (Award M4 for 8133.3…….. if $\frac{24\,400}{3}$ is not seen)
		$\frac{24\,400}{3}$		A1 $8133.\dot{3}$ or $8133\frac{1}{3}$ (as exact form was requested) SC B4 for an answer of 25551(.62….) if no method shown
				Total 5 marks

Q	**Working**	**Answer**	**Mark**	**Notes**

Q	Working	Answer	Mark	Notes
18	10 ÷ 20 (= 0.5) or a correct value on the FD scale and no errors or 25 small squares = 5 children or 5 small squares = 1 child oe or 1 small square = 0.2 children oe or 29 oe or 48 oe or 10 (associated with 75-80 bar)		3	M1
	(10 × 2.9) + (15 × 3.2) + (5 × 2) or 29 + 48 + 10 or (5.8 + 9.6 + 2) × 5 oe or (145 + 240 + 50) × 0.2 oe			M1for a fully correct method
		87		A1
				Total 3 marks

Q		Working	Answer	Mark	Notes
19	(a)	$(18-3)^2+(7--1)^2$ oe or $15^2+8^2\ (=289)$ oe		3	M1
		$\sqrt{(18-3)^2+(7--1)^2}\ (=\sqrt{"289"})$			M1
			17		A1
	(b)	13 + 6 > "17"	correct reason	1	A1ft dep M1 **Acceptable examples** "They overlap by 2cm" "The distance between the centres is less than the sum of the radii" "17 is less than the distance than the total of the radii" "19 is bigger than the distance between the centres" **Not acceptable examples** "19 is greater than the distance between the circles" oe "The circumference of each circle overlaps"
					Total 4 marks

Q	Working	Answer		Mark	Notes
20	eg $2d \times 2d - 4 \times \pi \times (\frac{1}{2}d)^2 (= 40)$ or $4r \times 4r - 4 \times \pi \times r^2$ (= 40) oe		4	M1	oe a correct expression for the shaded area
	$d = \sqrt{\frac{40}{4-\pi}} (= 6.826...)$ or $r = \sqrt{\frac{40}{16-4\pi}}$ (3.413...) oe			M1	oe a correct equation for d or r
	(perimeter =) $8 \times d$ or $16 \times r$ or 8×6.826 or $16 \times 3.413...$ oe			M1	indep – allow anywhere in calculation
		54.6		A1	54.4 - 54.7
					Total 4 marks

			Average score of candidates achieving grade:								
Qn	**Max score**	**Mean %**	**ALL**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**U**
1	3	84	2.53	2.96	2.87	2.67	2.37	1.94	1.43	0.89	0.41
2	3	82	2.46	2.94	2.85	2.68	2.35	1.80	1.02	0.31	0.07
3	5	81	4.04	4.84	4.68	4.38	3.86	2.98	1.62	0.56	0.12
4	4	80	3.20	3.93	3.73	3.41	2.94	2.26	1.31	0.61	0.17
5	3	81	2.44	2.89	2.74	2.53	2.28	1.90	1.38	0.78	0.28
6	4	73	2.93	3.85	3.65	3.27	2.47	1.42	0.52	0.17	0.04
7	4	81	3.22	3.81	3.54	3.24	2.95	2.57	2.10	1.73	1.06
8	4	67	2.68	3.86	3.38	2.71	1.95	1.22	0.53	0.20	0.06
9	3	67	2.01	2.82	2.51	2.07	1.54	0.92	0.44	0.20	0.09
10	5	68	3.40	4.78	4.16	3.45	2.73	1.77	0.79	0.25	0.05
11	3	68	2.05	2.74	2.36	2.04	1.68	1.32	0.92	0.55	0.22
12	5	55	2.76	4.66	3.81	2.50	1.27	0.54	0.25	0.06	0.02
13	4	65	2.60	3.60	2.99	2.53	2.10	1.57	1.06	0.71	0.38
14	4	53	2.12	3.60	2.90	1.89	0.97	0.44	0.16	0.05	0.01
15	4	51	2.05	3.34	2.64	1.95	1.23	0.58	0.16	0.05	0.02
16	6	50	3.02	4.89	3.72	2.73	1.87	1.17	0.67	0.34	0.11
17	5	44	2.19	4.12	2.86	1.70	0.86	0.37	0.14	0.09	0.08
18	3	38	1.13	2.13	1.44	0.86	0.47	0.23	0.10	0.03	0.01
19	4	38	1.51	3.14	1.83	1.00	0.48	0.19	0.07	0.01	0.00
20	4	19	0.77	2.38	0.48	0.10	0.02	0.01	0.00	0.00	0.00
	80	**61**	**49.11**	**71.28**	**59.14**	**47.71**	**36.39**	**25.20**	**14.67**	**7.59**	**3.20**

Suggested grade boundaries

Grade	**9**	**8**	**7**	**6**	**5**	**4**	**3**
Mark	65	53	42	31	20	11	5