Practice Tests Set 22 – 2F–3F mark scheme

Qn		Working	Answer	Mark		Notes
1	(a)		5.6	1	B1	oe e.g. $\frac{28}{5}$, $5\frac{3}{5}$
	(b)		2744	1	B1	Allow 2,744
						Total 2 marks

Qn	Working	Answer	Mark		Notes
2	256 ÷ 8 (= 32) **or** 8 × 32 = 256 **or** 2.48 ÷ 8 (= 0.31)		3	M1	for a correct first step
	"32" × 2.48 **or** 256 × "0.31"			M1	for a complete method or $\frac{1984}{25}$
		79.36		A1	
					Total 3 marks

Qn	Working	Answer	Mark		Notes
3	e.g. 5950 ÷ 1000 (= 5.95) **or** 9000 ÷ 1000 (= 9) **or** 14.5 × 1000 (= 14 500) **or** 30 × 1000 (= 30 000) **or** (5950 + 9000) ÷ 1000 (= 14.95)		3	M1	for one correct conversion
	e.g. "5.95" + 14.5 + "9" (= 29.45) **or** "14.95" + 14.5 (= 29.45) **or** **or** 5950 + "14 500" + 9000 (= 29 450) **or** 30 000 – (5950 + "14 500" + 9000) = 550 **or** 30 – ("5.95" + 14.5 + "9") = 0.55(0)			M1	for a complete method for adding with their adjusted figures
		Shown with correct figures		A1	e.g. Shown with 29.45 Shown with 29 450 Shown 550 Shown 0.55(0)
					Total 3 marks

Qn		Working	Answer	Mark		Notes
4	(a)	$2.6 \times 40 + 30$ oe		2	M1	
			134		A1	allow 2 h 14 mins
	(b)	$2 \times 60 + 40$ (= 160) oe		3	M1	convert 2 hours 40 minutes to minutes
		(“160” − 30) ÷ 40 **or** “130” ÷ 40			M1	for a complete method
			3.25		A1	oe eg $3\frac{1}{4}$ or $\frac{13}{4}$ (Note: may see use of their part (a))
						Total 5 marks

Qn	Working	Answer	Mark		Notes
5	$\frac{62.3...}{6.07...}$		2	M1	for 62.3(2) **or** 6.07(646…) **or** 10.2 **or** 10.3 **or** 10.25 **or** 10.26 **or** 10.255 **or** 10.256
		10.2559(6871)		A1	
					Total 2 marks

Qn	Working	Answer	Mark		Notes
6	e.g. $5\times\left(\frac{1}{2}\right)^2-\frac{1}{4}$ or $5\times(0.5)^2-0.25$ oe or $5\times\frac{1}{4}-\frac{1}{4}$ oe or $5\times0.25-0.25$ oe		2	M1	for a complete method
		1		A1	oe
					Total 2 marks

Qn	Working	Answer	Mark	Notes
7	e.g. 0.5 × (6 + 13) × 3		2	M1 for a complete method
		28.5		A1 oe
				Total 2 marks

Qn		Working	Answer	Mark	Notes
8	(a)(i)		31	1	B1
	(ii)		Correct explanation	1	B1 e.g. 'I added 6', 'add 6', +6, $6n - 5$ (need to know 6 and we need to add/go up oe)
	(b)		Correct explanation	1	B1 **Acceptable** e.g. • Should be 187 oe • 188 is even or not odd • 187 and 193 (are in the sequence) Terms end in 1, 3, 5, 7, 9 or odd numbers Sequence is odd $6n - 5 = 188$ gives a decimal or not a whole number Need to minus 1 oe **Not acceptable** e.g. • It goes past 188 oe 193 is after 188 oe
					Total 3 marks

Qn		Working	Answer	Mark	Notes
9	(a)		8 800 000	1	B1
	(b)		Barcelona	1	B1 accept 5.5×10^6
	(c)	$3.7 \times 10^7 - 7.7 \times 10^6$ **or** 29 300 000 oe or 37 000 000 – 7 700 000 or 29 000 000 oe or $0.29(3) \times 10^8$ or $29(.3) \times 10^6$		2	M1 allow $2.9(3) \times 10^n$ ($n \neq 7$)
			2.9×10^7		A1 accept -2.9×10^7 accept 2.93×10^7 or -2.93×10^7
					Total 4 marks

Qn	Working	Answer	Mark	Notes
10	$9.2 \times \frac{500}{1000}$ **or** 9.2 ÷ 2 (= 4.6) oe		4	M1 for a method to find the cost of 500g of Cheddar
	6.3 – "4.6" (= 1.7)			M1 for a method to find the cost of 200g of Stilton
	$"1.7" \times \frac{1000}{200}$ **or** "1.7" × 5 oe			M1 for a complete method to find the cost of 1kg of Stilton
		8.5(0)		A1
				Total 4 marks

Qn		Working	Answer	Mark		Notes
11	(a)		0.45	1	B1	oe eg $\frac{9}{20}, \frac{45}{100}, 45\%$
	(b)	eg 1 – (0.25 + 0.2 + 0.2) (= 0.35) **or** 1 – (“0.45” + 0.2) (= 0.35) **or** $300\times(0.25+0.2+0.2)(=195)$		3	M1	allow use of their “0.45” from part (a), check the table
		eg 300 × “0.35” **or** $300-"195"$			M1	for a complete method
			105		A1	cao (award $\frac{105}{300}$ M2 only)
						Total 4 marks

Qn		Working	Answer	Mark		Notes
12	(a) (i)		27	1	B1	
	(ii)		5, 16	1	B1	either or both indicated
	(b)	5 or 23 identified as a prime **or** 5 + 23		2	M1	at least one prime identified
			28		A1	
						Total 4 marks

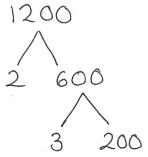
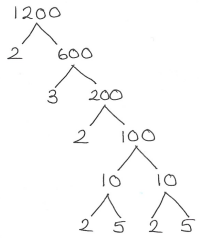
Qn	Working	Answer	Mark		Notes
13	5 × 12 (= 60) **or** $\frac{15+7-2+23+x}{5}=12$ oe **or** $\frac{x+"43"}{5}=12$		3	M1	for a method to find the total of the 5 numbers **or** setting up an equation in x “43” comes from 15 + 7 – 2 + 23
	x + 15 + 7 – 2 + 23 = “60” **or** x + “43” = ”60” **or** “60” – (15 + 7 – 2 + 23)			M1	for forming an equation with their 60 **or** for a complete calculation to find the value of x “43” comes from 15 + 7 – 2 + 23
		17		A1	
					Total 3 marks

Qn		Working		Answer	Mark		Notes
14	(a)	150 ÷ (90 ÷ 18) oe eg 150 ÷ 5			2	M1	for a complete method to find the number of people for running
				30		A1	if answer line is blank, check the table for answer
	(b)	eg 360 − (90 + 150 + 15 × "5") (= 45) oe	eg 360 ÷ "5" (= 72)		3	M1	for working out the angle for swimming **or** the total number of people check the table for answers ft their "5" from 90 ÷ 18
		"45" ÷ "5"	"72" – (18 + 15 + "30")			M1	for a complete method to work out the number of people for swimming ft their "5" from 90 ÷ 18 ft their "30" from (a)
				9		A1	if answer line is blank, check the table for answer
							Total 5 marks

Qn	Working	Answer	Mark	Notes
15	6 hrs 40 mins or $6\frac{2}{3}$ or $\frac{20}{3}$ or 400 mins		4	B1
	e.g. $(6 \times 60 + 40) \times 60$ (= 24 000) oe or "their 400" × 60 (= 24 000) oe or $\frac{60}{8}$ (= 7.5) oe or $\frac{60 \times 60}{8}$ (= 450) oe or 7.5×60 (= 450) oe			M1 for converting their time difference into seconds **or** finding the number of bolts produced in 1 minute oe **or** finding the number of bolts produced in one hour oe
	e.g. "24 000" ÷ 8 oe or "their 400" × "7.5" oe or "their $6\frac{2}{3}$" × "450" oe			M1 for a complete method to find how many bolts are produced
		3000		A1
				Total 4 marks

Qn	Working	Answer	Mark	Notes
16		$T = 0.2(12n + 50)$ oe	3	B3 for $T = 0.2(12n + 50)$ oe or $T = 0.2 \times (12n + 50)$ oe for $T = 0.2 \times (12 \times n + 50)$ oe or $T = \frac{12n + 50}{5}$ oe or $T = 2.4n + 10$ oe B2 for $0.2(12n + 50)$ oe or $0.2 \times 12n + 50$ oe or $T = 0.2 \times 12n + 50$ oe or $T = n \times 12 + 50 \times 0.2$ oe or $T = 12n + 50 \div 5$ oe or $T = n(12) + 50(0.2)$ oe B1 for $n \times 12 + 50 \times 0.2$ oe or $12n + 50 \div 5$ oe or $n(12) + 50(0.2)$ oe or T = a linear expression in n e.g. $T = n$
				Total 3 marks

Qn	Working	Answer	Mark		Notes	
17	18000×0.15 (= 2700) oe **or** 18000×0.85(= 15 300) oe		3	M1	for finding 15% or 85% of 18 000	M2 for 18000×0.85^4 oe **or** 18000×0.85^5(= 7986.(69…)) oe
	eg 18000×0.85^4 oe **or** "15300"$\times0.85\times0.85\times0.85$oe **or** "15300"$\times0.85$(=13005) oe **and** "13005"$\times0.85$(=11054.25)oe **and** "11054.25"$\times0.85$oe			M1	(dep) for a complete method	
		9396		A1	awrt 9396	
					If no marks awarded, award SCB1 for **or** 18000×0.85^2 (= 13 005) oe **or** 18000×0.85^3(= 11 054.(25)) oe **or** 18000×0.4 (= 7200) oe **or** 18000×1.15 (= 20700) oe **or** 18000×1.15^4 (= 31482.(1125)) oe	
						Total 3 marks

<table>
<tr><th>Qn</th><th>Working</th><th>Answer</th><th>Mark</th><th></th><th>Notes</th></tr>
<tr><td>18</td><td>eg 2 × 2 × 300
2 × 5 × 120
2 × 3 × 200
3 × 5 × 80 or
eg
 
or
<table><tr><td>2</td><td>1200</td></tr><tr><td>3</td><td>600</td></tr><tr><td></td><td>200</td></tr></table></td><td></td><td>3</td><td>M1</td><td>for at least 2 correct stages in prime factorisation which give 2 prime factors – may be in a factor tree or a table or listed eg 2, 2, 300 (allow no more than one mistake ft (eg one mistake with 2 prime factors ft 1200 = 20 × 600 =
2 × 10 × 3 × 200))</td></tr>
<tr><td></td><td>2, 2, 2, 2, 3, 5, 5
or
 
oe
<table><tr><td>2</td><td>1200</td></tr><tr><td>3</td><td>600</td></tr><tr><td>2</td><td>200</td></tr><tr><td>5</td><td>100</td></tr><tr><td>2</td><td>20</td></tr><tr><td>5</td><td>10</td></tr><tr><td>2</td><td>2</td></tr><tr><td></td><td>(1)</td></tr></table></td><td></td><td></td><td>M1</td><td>for finding the correct prime factors condone inclusion of 1 (may be seen in a fully correct factor tree or ladder)</td></tr>
<tr><td></td><td></td><td>$2^4 \times 3 \times 5^2$</td><td></td><td>A1</td><td>(dep on M2 as working requested)
Can be in any order (allow 2^4 . 3 . 5^2) but must be in index form as asked for.</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>Total 3 marks</td></tr>
</table>

Qn	Working	Answer	Mark		Notes
19	eg 0.45×180 (= 81) oe **OR** $\frac{15}{180}\left(=\frac{1}{12} \text{ or } 0.0833...\right)$ **OR** $\frac{15}{180}\times 100\left(=8.3(33...)\%\right)$		4	M1	for a method to find the number of students studying German **OR** the number of students studying French as a fraction or decimal of the total students **OR** a method to find the percentage of students studying French 81 may be seen as part of an equation
	eg 180 – 15 – "81" (= 84) **or** "81" + 15 (= 96) **OR** $1-\left(\frac{1}{12}+\frac{45}{100}\right)=\left(\frac{7}{15} \text{ or } 0.466...\right)$ **or** $\frac{1}{12}+\frac{45}{100}=\left(\frac{8}{15} \text{ or } 0.533...\right)$ **OR** 100 – ("8.3" + 45) (= 46.6(66…) or 46.7%) **or** "8.3" + 45 (= 53.3(33…) or 53.3%)			M1	for a method to find the number of students studying Italian/Spanish **or** French/German **OR** a method to find the fraction or decimal of students studying Italian/Spanish **or** French/German **OR** a method to find the percentage of students studying Italian/Spanish **or** French/German 84 or 96 may be seen as part of an equation
	eg $\frac{"84"}{180-"84"}(\times 100)\left(=\frac{7}{8} \text{ or } 0.875\right)$ **or** $\frac{"84"}{"96"}(\times 100)\left(=\frac{7}{8} \text{ or } 0.875\right)$ **or** $"\frac{7}{15}"\div"\frac{8}{15}"\left(=\frac{7}{8} \text{ or } 0.875\right)$ **or** $\frac{"46.6"}{"53.3"}(\times 100)(=0.872...)$			M1	for a complete method to find the fraction or decimal or percentage of Italian/Spanish to French/German
		87.5		A1	accept 87.2 – 87.7
					Total 4 marks

Qn	Working	Answer	Mark	Notes
20	e.g. $\frac{4}{10}$ **or** 0.4 **or** 25% **or** 0.25		4	M1 for a correct conversion
	e.g. $1-"\frac{4}{10}"-\frac{1}{4}\left(=\frac{7}{20}\right)$ **or** 1 – "0.4" – "0.25" (= 0.35) **or** 100 – 40 – "25" (= 35)			M1 for a complete method to find proportion of money spent on petrol
	e.g. "their $\frac{7}{20}$":1 **or** "their 0.35" : 1 **or** "their 35" : 100			M1 for an equivalent ratio
		7 : 20		A1 cao SC M3 for 20 : 7
				Total 4 marks

Qn	Working	Answer	Mark	Notes
21	eg 10.5 ÷ (5 – 2) (= 3.5(0)) **or** $\frac{5}{7}-\frac{2}{7}\left(=\frac{3}{7}\right)$ **or** $10.5\times\frac{5}{5-2}(=17.5)$ **or** $10.5\times\frac{2}{5-2}(=7)$		3	M1 for finding the value of one share **or** the difference as a fraction **or** Bella's share **or** Millie's share
	eg $"3.5"\times 7$ **or** $10.5\div"\frac{3}{7}"$ or "17.5" + "7"			M1 for a complete method
		24.5(0)		A1 oe eg $\frac{49}{2}$
				SCB1 for an answer of 3 and/or 7.5 oe
				Total 3 marks

Qn	Working	Answer	Mark		Notes
22	eg $\frac{158+C}{2}=160$ **or** (C =) 160 + (160 – 158) (= 162) oe **or** (C =) 162		3	M1	for method to find Candela's height or Candela's height or Candela's height in the wrong place on the answer line
	eg (D =) 175 – 21 **(**= 154) oe			M1	indep for method to find Diana's height or Diana's height or Diana's height in the wrong place on the answer line
		Candela 162 Diana 154		A1	Correctly attributed If no marks awarded, SCB1 for Candela's height 179
					Total 3 marks

Qn	Working	Answer	Mark		Notes
23	$\sqrt{36}(=6)$ **or** 6 **or** 6×6		4	M1	for method to find the length of the square – may be seen in later working
	eg $\pi \times \left(\frac{[\text{their } 6]}{2}\right)^2 \div 2 (=14.1... \text{ or } 4.5\pi \text{ or } \frac{9}{2}\pi)$ **or** $\pi \times \left(\frac{[\text{their } 6]}{2}\right)^2 (=28.2... \text{ or } 9\pi)$			M1	for method to find the area of one semicircle **or** circle or the incorrect number of semicircles or circles provided correct area of circle formula is seen for $_{[\text{their } 6]}$ allow any value if there is a clear implication this is their side length of square.
	eg $4 \times$ "14.1" $(= 56.5... \text{ or } 18\pi)$ **or** $2 \times$ "28.2" $(= 56.5... \text{ or } 18\pi)$			M1	for a complete method to find the total area of the semicircles ft from previous M1 [if the pupil multiplies again and uses the incorrect number of circles or semicircles this mark is not awarded]
		92.5		A1	accept 92.4 – 92.6 (not in terms of π)
					Total 4 marks

Qn	Working	Answer	Mark		Notes
24	eg (V=) $\pi \times \left(\frac{18}{2}\right)^2 \times 3.5$ (= 890.(64…) or $\frac{567}{2}\pi$)		3	M1	correct method to calculate volume
	eg $(7.04 \times 1000) \div$ "890.64"			M1	correct method to calculate density (if volume is incorrect, their value can be used if clearly labelled) accept use of 7.04 or an incorrect conversion from kg to g for mass
		7.9		A1	accept 7.9 − 7.92
					Total 3 marks

						Average scores of candidates who achieved grade:					
Question	**Skill tested**	**Mean score**	**Max score**	**Mean %**	**ALL**	**5**	**4**	**3**	**2**	**1**	**U**
1	Powers and roots	1.92	2	96	1.92	1.99	1.97	1.97	1.91	1.61	1.37
2	Applying number	2.46	3	82	2.46	2.92	2.73	2.46	2.07	1.19	0.19
3	Mensuration of 2D shapes	2.23	3	74	2.23	2.89	2.53	2.30	1.39	0.67	0.11
4	Expressions and formulae	3.68	5	74	3.68	4.57	4.18	3.47	2.62	2.01	0.41
5	Electronic calculators	1.56	2	78	1.56	1.76	1.63	1.57	1.47	1.13	0.33
6	Expressions and formulae	1.36	2	68	1.36	1.85	1.63	1.25	0.77	0.23	0.07
7	Mensuration of 2D shapes	1.25	2	63	1.25	1.82	1.54	1.02	0.55	0.17	0.00
8	Sequences	2.23	3	74	2.23	2.48	2.29	2.29	2.15	0.00	0.00
9	Standard form	2.68	4	67	2.68	3.44	3.02	2.37	2.16	0.00	0.00
10	Applying number	2.40	4	60	2.40	3.55	2.73	1.98	1.20	0.93	0.15
11	Probability	2.14	4	54	2.14	3.55	2.69	1.40	0.48	0.34	0.00
12	Integers	2.37	4	59	2.37	3.19	2.60	2.20	1.52	1.04	0.74
13	Statistical measures	1.53	3	51	1.53	2.65	1.90	0.89	0.38	0.09	0.00
14	Graphical representation of data	2.55	5	51	2.55	4.29	2.95	1.67	0.92	0.64	0.41
15	Measures	1.71	4	43	1.71	3.05	1.99	1.13	0.46	0.06	0.00
16	Expressions and formulae	1.15	3	38	1.15	2.12	1.33	0.68	0.28	0.09	0.00
17	Applying number	1.13	3	38	1.13	2.12	1.24	0.68	0.32	0.13	0.11
18	Powers and roots	1.18	3	39	1.18	2.26	1.24	0.72	0.42	0.09	0.00
19	Percentages	1.18	4	30	1.18	2.03	1.43	0.74	0.31	0.06	0.07
20	Ratio and proportion	1.18	4	30	1.18	2.11	1.25	0.83	0.40	0.20	0.07
21	Ratio and proportion	0.73	3	24	0.73	1.61	0.77	0.28	0.07	0.01	0.04
22	Statistical measures	0.73	3	24	0.73	1.41	0.75	0.46	0.19	0.09	0.04
23	Mensuration of 2D shapes	0.97	4	24	0.97	2.44	0.84	0.25	0.06	0.08	0.00
24	Measures	0.60	3	20	0.60	1.40	0.58	0.22	0.04	0.00	0.00
		40.92	**80**	**51**	**40.92**	**61.50**	**45.81**	**32.83**	**22.14**	**10.86**	**4.11**

Suggested grade boundaries

Grade	**5**	**4**	**3**	**2**	**1**
Mark	54	39	27	16	9