Unit 2 Foundation Tier
Mark scheme

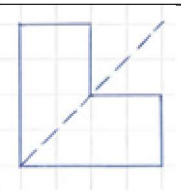
Apart from questions where the mark scheme states otherwise, the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.

Question		Working	Answer	Mark	Notes
1	(a)		$8a$	1	B1 cao
	(b)		$24b$	1	B1 cao
	(c)		27	1	B1 cao
					Total 3 marks

Question		Working	Answer	Mark	Notes
2	(a)		B	1	B1 Accept b **or** 'Country B' allow incorrect spelling if meaning is clear
	(b)		bar at height of 7	1	B1 any width is acceptable
	(c)		11	1	B1 Allow 11 million **or** 11 000 000 in the answer space
					Total 3 marks

Question	Working	Answer	Mark	Notes
3 (a)(i)		37	1	B1
(ii)		+6	1	B1 oe eg 'added 6' **or** 'plus 6' **or** $6n + 1$ allow $31 + 6 = 37$ increase by 6 / goes up by 6
(b)		169	1	B1
(c)		All the numbers in the sequence are odd numbers	1	B1 96 is not odd / 96 is even 96 is a multiple of 6 (**and** terms are not multiples of 6) **or** No numbers in the sequence end in 6 / all end in 1, 3, 5, 7, 9 **or** the sequence is $6n + 1$ **or** it goes ....91, 97, ... oe **or** it should be 97 They need to add 1
				Total 4 marks

Question	Working	Answer	Mark	Notes
4 (a)		Marked at 360	1	B1
(b)		145	1	B1 oe eg 1345, quarter to two/2 Ignore any am **or** pm
(c)		centimetres	1	B1 **or** cm
				Total 3 marks

Question	Working	Answer	Mark	Notes
5 (a)		C, E	1	B1 accept **E and C** as order does not matter
(b)		F	1	B1 an answer of F only
(c)		Correct line	1	B1 correct line with no other lines
(d)		12	1	B1
(e)		8	1	B1
				Total 5 marks

Question	Working	Answer	Mark	Notes
6 (a)		line of length 6.5 cm drawn	1	B1 ±2 mm
(b)		44	1	B1 Accept answers in the range 42-46 including decimals **and** fractions
				Total 2 marks

Question	Working	Answer	Mark	Notes
7	eg 10:50am + 45mins = 11:35am **or** 10:50am + 1hr10mins = 12:00pm **or** 2:20pm – 45mins = 1:35pm **or** 2:20pm – 1hr10mins = 1:10pm **or** 45mins + 1hr10mins = 1hr55mins **or** 115mins **or** 10:50am to 2:20pm = 3hr30mins **or** 210mins		3	M1 for correctly working with two times condone missing am **or** pm
	eg 10:50am + 45mins + 1hr10mins = 12:45pm **or** 10:50am + 1hr55mins = 12:45pm **or** 2:20pm – 45mins – 1hr10mins = 12:25pm **or** 2:20pm – 1hr55mins = 12:25pm			M1 ft for getting to a time one step from the answer **or** 1hr35mins **or** a correct ft from a previous error condone missing am **or** pm
	Correct answer scores full marks (unless from obvious incorrect working).	95		A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
8	12 × 1.40 + 12 × 0.5 ×1.40 (= 25.20) oe eg (1.4 + 0.7) × 12 (= 25.20)		4	M1 correct method to find the cost for offer A
	0.8 × 7.20 × "4" (=23.04) oe **or** "4" × 7.20 – 0.2 ("4" × 7.20) oe eg 28.80 – 5.76 (= 23.04) where 4 = 24 ÷ 6			M1 indep correct method to find the cost for offer B
	12 × 1.40 + 12 × 0.5 ×1.40 – 0.8 × 7.20 × 4 **or** "25.20" – "23.04"			M1 dep on M2 A fully correct method to find the difference
	Correct answer scores full marks (unless from obvious incorrect working).	2.16		A1 allow –2.16
				Total 4 marks

Question	Working	Answer	Mark	Notes
9	Triangle drawn with intersecting arcs 6 cm from *B* **and** 9 cm from *A*	Triangle drawn with correct intersecting arcs 6 cm from *A* **and** 9 cm from *B*	2	B2 for triangle drawn with correct intersecting arcs 6 cm from *A* **and** 9 cm from *B* within the overlay (B1 for two intersecting arcs within the overlay **or** accurate triangle drawn with no arcs)
				Total 2 marks

Question	Working	Answer	Mark	Notes
10	200 (m*l*) written as 0.2 (*l*) **or** 3.5 (*l*) written as 3500 (m*l*)		4	B1 for a correct conversion
	3 × "0.2" (= 0.6) oe eg 0.2 + 0.2 + 0.2 **or** 3 × 200 (= 600) oe eg –200–200–200 **or** 3500 – 600 (= 2900)			M1 A correct calculation for the total amount of water in the 3 cups **or** the 4 jugs
	$\frac{3.5 - "0.6"}{4}$ **or** $\frac{"3500" - "600"}{4}$			M1 For a fully correct method **or** for an answer of 0.725 (this alone gains B1M2)
	Correct answer scores full marks (unless from obvious incorrect working).	725		A1 (SCB1M1 (no other marks) for (3.5 – 0.2) ÷ 4 (= 0.825) **or** (3500 – 200) ÷ 4 (= 825))
				Total 4 marks

Question	Working	Answer	Mark	Notes
11	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** $\frac{1984}{25}$
	Correct answer scores full marks (unless from obvious incorrect working).	79.36		A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
12 (a)		$7p - t$	2	B2 Fully correct answer (allow $-1t$) (B1 for $7p$ **or** $-t$)
(b)	eg 8 × 5 – 3 × 4 **or** 40 – 12		2	M1 for a complete method
	Correct answer scores full marks (unless from obvious incorrect working).	28		A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
13 (a)	$\frac{10.1}{39.8} \times 100$ oe **or** $\frac{10\,100\,000}{39\,800\,000} \times 100$		2	M1
	Correct answer scores full marks (unless from obvious incorrect working).	25.4		A1 awrt
(b)	$\frac{21}{100} \times 59.9$ (= 12.579) oe **or** $\frac{21}{100} \times 59\,900\,000$ (= 12 579 000) oe		3	M1 $\frac{21}{100} \times 59.9$ oe **or** $\frac{21}{100} \times 59\,900\,000$ oe
	59.9 + "12.579" (= 72.479) **or** 59 900 000 + 12 579 000 (= 72 479 000)			M1
	Correct answer scores full marks (unless from obvious incorrect working).	72		A1 Accept 72 – 73 **or** 72 000 000 – 73 000 000
				Total 5 marks

Question	Working	Answer	Mark	Notes
14		$T = 0.2(12n + 50)$ 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** $T = 2.4n + 10$
				(B2 for $0.2(12n + 50)$ oe **or** $0.2\times(12n + 50)$ oe **or** $T = 0.2 \times 12n + 50$ oe **or** $T = n \times 12 + 50 \times 0.2$ **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 eg $T = n$)
				Total 3 marks

Question	Working	Answer	Mark	Notes
15	0.85 × 1000 (= 850) **or** 360 ÷ 1000 (= 0.36)		4	M1 for a correct conversion of kg to g **or** g to kg
	360 ÷ 15 (= 24) **or** "0.36" ÷ 15 (= 0.024) **or** "850" ÷ 38 (= 22.368….) **or** 0.85 ÷ 38 (= 0.022368….) **or** "850" ÷ 360 (= $\frac{85}{36}$ = 2.3(6…)) **or** $\left(\frac{38}{15}\right) 2\frac{8}{15} \left(= 2.5...\right)$			M1 oe
	360 ÷ 15 (= 24) **and** "850" ÷ 38 (= 22.368….) **or** "0.36" ÷ 15 (= 0.024) **and** 0.85 ÷ 38 (= 0.022368….) **or** 360 ÷ 15 (= 24) **and** "850" ÷ 24 (= 35.4…) **or** "0.36" ÷ 15 (= 0.024) **and** 0.85 ÷ '0.024' (= 35.4…) **or** "850" ÷ 360 (= $\frac{85}{36}$ = 2.3(6…)) **and** "2.3(6…)" × 15 (= 35.4) **or** $\left(\frac{38}{15}\right) 2\frac{8}{15} \left(= 2.5...\right)$ **and** $"2\frac{8}{15}"\times"0.36"$ (= 0.912) **or** $\left(\frac{38}{15}\right) 2\frac{8}{15} \left(= 2.5...\right)$ **and** $"2\frac{8}{15}"\times"360"$ (= 912) **or** 360 ÷ 15 (= 24) **and** "24" × 38 (= 912) **or** "0.36" ÷ 15 (= 0.024) **and** "0.024" × 38 (= 0.912)			M1 calculations that compare the same amounts eg How much flour is needed for recipe **and** how much Johan has for each cake **or** Working out how many cakes Johann can make with his flour to compare with 38 cakes **or** Working out how much flour is needed to enable comparison with given figure of 0.85 kg
	Working required	No **and** correct figures seen		A1 No **or** statement that clearly states that there is not enough flour to make 38 cakes

				and correct figures **-** figures may be rounded in working and produce slightly different results which are acceptable eg "2.3(6…)" × 15 allow 34 **–** 36 Must compare 912 with 850 **or** implied by 62 seen
				Total 4 marks

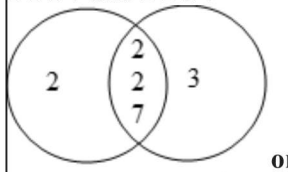
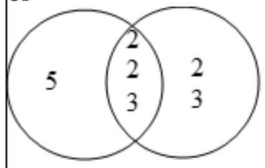
Question	Working	Answer	Mark	Notes
15 **ALT**	0.85 × 1000 (= 850)		4	M1
	eg 15 + 15 (= 30) **or** 15 ÷ 2 (= 7(.5) **or** 8)			M1
	eg 15 + 15 + 7(.5) (= 37(.5)) **or** 15 + 15 + 8 (= 38)			M1
	Working required	No **and** 37(.5) **or** 38 seen		A1 oe No **and** 37(.5) **or** 38 seen
				Total 4 marks

Question	Working	Answer	Mark	Notes
15 **ALT**	0.85 × 1000 (= 850)		4	M1
	360 ÷ 15 (= 24)			M1
	(360) 15 (360) 15 (24) 1 (24) 1 (24) 1 (24) 1 (24) 1 (24) 1 (864) 36 eg for a build-up method			M1
		No **and** 36 seen		A1 oe No **and** 36 seen
				Total 4 marks

Question	Working	Answer	Mark	Notes
16 (a)	(0 × 6) + (1 × 5) + (2 × 4) + (3 × 7) + (4 × 3) (= 46) **or** 0 + 5 + 8 + 21 + 12 (= 46)		3	M1 for at least 4 products added **or** intention to add (need not be evaluated)
	'46' ÷ 25			M1 dep on M1
	Correct answer scores full marks (unless from obvious incorrect working).	1.84		A1 SC B1 for answer only of 2.08 oe
(b)		0.61	1	B1 oe 61% **or** $\frac{61}{100}$ oe
				Total 4 marks

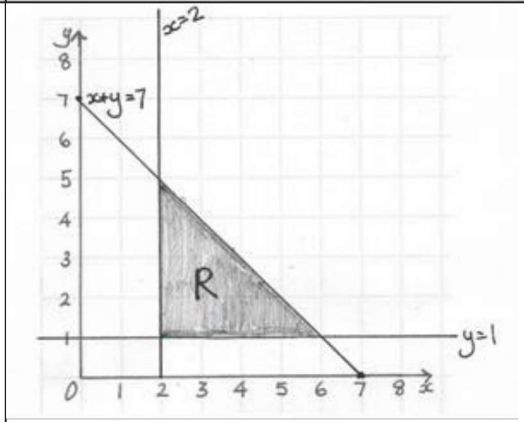
Question	Working	Answer	Mark	Notes
17 (a)	Rotation, rotate, rotated (not turn)	rotation	2	B1 oe with no mention of reflection, translation, enlargement, move, flip etc
		180° about (0, 0) **or** O		B1 oe with no mention of a line, column vector **or** SF (SCB1 for 'half turn about (0, 0) **or** O' with no contradictory statements) **Alternative**: B2 for enlargement with centre O **and** SF -1 (B1 for enlargement with no mention of other transformation, B1 for centre O **and** SF -1)
(b)	(−4, 1)(−6, 1)(−6, 3)(−5, 3)(−5, 4)(−4, 4)	A correct shape	2	B2 (B1 for a 'correct' shape reflected in any vertical line **or** a correct reflection in the line $y = -1$ **or** reflection of shape **B** in the line $x = -1$)
				Total 4 marks

Question	Working	Answer	Mark	Notes
18	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
	Correct answer scores full marks (unless from obvious incorrect working).	17		A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
19 (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** eg **28** 56 84 **2** **3**		2	M1 for any correct valid method **and** no errors eg 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, eg table
	Working required	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 **2** 60 72 **2** 30 36 **3** 15 18 **2** **5** 6 **3** **or**  **or** $\frac{60\times72}{12}$ **or** 2, 2, 2, 3, 3, 5 oe		2	M1 for any correct valid method **and** no errors eg 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, eg table
	Working required	360		A1 dep M1 accept $2^3 \times 3^2 \times 5$ oe
				Total 4 marks

Question	Working	Answer	Mark	Notes
20	$\left(4^n =\right)\left(2^2\right)^n$ **or** $\left(4^n =\right)2^{2n}$ oe eg $2^k \div 2^{2n} = 2^x$ **or** $2^k = 4^{\frac{1}{2}k}$ **and** $2^x = 4^{\frac{1}{2}x}$ oe eg $\frac{4^{\frac{1}{2}k}}{4^n} = 4^{\frac{1}{2}x}$		2	M1 for writing 4^n as $\left(2^2\right)^n$ **or** 2^{2n} **or** for writing each term in terms of 4 ie $2^k = 4^{\frac{1}{2}k}$ **and** $2^x = 4^{\frac{1}{2}x}$ If these things are seen in working, award this mark even if followed by incorrect working – if not a choice of methods.
	Correct answer scores full marks (unless from obvious incorrect working).	$k - 2n$		A1 allow 2^{k-2n}
				Total 2 marks

Question	Working	Answer	Mark	Notes
21	$7x + 3x + 8x = 360$ 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
	Correct answer scores full marks (unless from obvious incorrect working).	9		A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
22 (a)(i) (ii) (iii)	 Line length 2cm + but shaded area must be enclosed for the mark in (b)		3	B1 $y = 1$ drawn B1 $x = 2$ drawn B1 $x + y = 7$ drawn Allow dashed lines **or** solid lines for graphs **condone lack of labels if unambiguous**
(b)			1	B1 correct region shaded – shaded in **or** out – labelled **R or** clear intention to be the required region (ft only for one vertical line, one horizontal line **and** one line with a negative gradient)
				Total 4 marks

Question	Working	Answer	Mark	Notes
23			3	M1 for $d = 9$ **or** $(c + d) \div 2 = 8$ (algebraically **or** clearly labelled integers) **or** $d - a = 4$ (algebraically **or** clearly labelled integers)
				M1 for two of $a = 5$ **or** $c = 7$ **or** $d = 9$ **or** $(c + d) \div 2 = 8$ (algebraically **or** clearly labelled integers) **or** $d - a = 4$ (algebraically **or** clearly labelled integers)
		$a = 5$, $b = 6$, $c = 7$, $d = 9$		A1 All correct
				Total 3 marks

Question	Working	Answer	Mark	Notes
24	$1.4 = \frac{72}{(\text{area})}$ oe		4	M1
	$(\text{area} =) \frac{72}{1.4}$ $(= \frac{360}{7} = 51.4\ldots)$ 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
	Correct answer scores full marks (unless from obvious incorrect working).	926		A1 Allow 925 – 928
				Total 4 marks

Question	Working	Answer	Mark	Notes
25 (a)	1 + 0.04 (= 1.04) **or** 100(%) + 4(%) (= 104(%)) **or** (= 6100) oe		3	M1
	634 400 ÷ "1.04" **or** 634 400 ÷ "104" × 100 **or** 634 400 × 100 ÷ "104" oe			M1
	Correct answer scores full marks (unless from obvious incorrect working).	610 000		A1
(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 eg 200 × "0.85" × "0.85" (= 144.5) M2 for 15 + (0.15 × "85") **or** 15 + 12.75
	1 – "0.7225" **or** 0.2775 **or** 100 – "72.25"			M1 eg $\frac{200-"144.5"}{200}$ (×100)
	Correct answer scores full marks (unless from obvious incorrect working).	27.75		A1 oe allow 27.8 **or** 28
				Total 6 marks

Question	Working	Answer	Mark	Notes
26 (a)		8.9×10^{-5}	1	B1
(b)		83 400	1	B1
				Total 2 marks

Question	Working	Answer	Mark	Notes
27	300 ÷ (7 + 5 + 3) (= 20) **clear correct use** of 7 + 5 + 3 (= 15) eg division at the end by 15 $\left(\frac{"2.8"+"1.8"}{15}\right)$ **or** correct use of 15 in a fraction eg $\frac{2}{5}\times\frac{7}{15}$		5	M1 (no mark for "15" unless it is used correctly) use of 7 × 20 **or** 140 **or** 5 × 20 **or** 100 in further work assumes this mark
	$\frac{2}{5}\times(7\times"20")$ (= 56) oe eg 0.4 ×140 (= 56) **or** $\frac{2}{5}\times 7\left(=\frac{14}{5}=2.8\right)$ **or** eg $\frac{2}{5}\times\frac{7}{15}\left(=\frac{14}{75}=0.186...\right)$			M1 finding $\frac{2}{5}$ of the number of birthday cards **or** $\frac{2}{5}$ of the share of 7 **or** $\frac{2}{5}$ of fraction of amount
	0.36 × (5 × "20")(=36) **or** 0.36 × 5 (= 1.8) **or** eg $\frac{36}{100}\times\frac{5}{15}\left(=\frac{180}{1500}=0.12\right)$ oe			M1 finding 36% of anniversary cards **or** 36% of the share of 5 **or** 36% of fraction of amount
	$\frac{"56"+"36"}{300}$ **or** eg $\left(\frac{"2.8"+"1.8"}{15}\right)$ **or** $\frac{\frac{14}{5}+\frac{9}{5}}{15}$ $"\frac{14}{75}"+"\frac{180}{1500}"$			M1 for any fraction from correct working that isn't simplified **or** 30.66..% **or** 0.3066...
	Correct answer scores full marks (unless from obvious incorrect working).	$\frac{23}{75}$		A1 cao
				Total 5 marks

Question	Working	Answer	Mark	Notes
28	eg $+\begin{matrix}7x+3y=3\\9x-3y=21\end{matrix}$ **or** $+\begin{matrix}21x+9y=9\\21x-7y=49\end{matrix}$ **or** eg $7x+3(3x-7)=3$ **or** $7\left(\frac{7+y}{3}\right)+3y=3$		3	M1 a correct method to eliminate x **or** y – multiplying one **or** both equations so that one variable can be eliminated (allow a total of one error in multiplication) **and** the correct operation to eliminate **or** for substitution of one variable into the other equation.
	If first M1 gained then they can substitute an incorrect value if from 'correct' method to gain this mark.			M1 dep on M1 for a correct method to calculate the value of other letter eg substitution **or** starting again with elimination
	Working required	$x = 1.5$, $y = -2.5$		A1 oe dep on M1
				Total 3 marks