REVISE
.wales

F3.01 — Number, rounding & multipliers in context

Mark schemes for the F3.01 question pack

Spec 1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.4.8, 1.4.9, 1.6.1 — Unit 3

SOLUTIONS · 2025 SPECIFICATION

Mark schemes for the 59 questions in the corresponding revise.wales question pack (107 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes. Pack layout © revise.wales.

7. (a) (i) (x=) 8		B1	Accept embedded answers Mark final answer
7. (a) (ii) (y=) 64		B1`	Accept embedded answers Mark final answer
7.(b) 4k		B1	

14.	7		B3	B2 for 5. B1 for 4 or 6 or 8 or 9

4.(a) (i) 22 (cm)	B1	
4.(a) (ii) 18 cm^2	B1 U1	
4.(b) Rectangle 3 × 6	B1	Accept any rectangle with an area of 18 cm^2 which fits on the grid e.g. 4 × 4.5 FT 'their (a)(ii)'

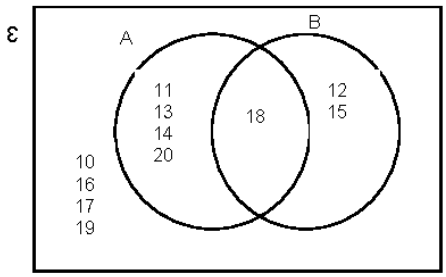
		If no marks gained allow SC1 for sight of 9.
20.(a) $1 - 0{\cdot}36 - 0{\cdot}12 - 0{\cdot}24$ $= 0{\cdot}28$	M1 A1	
20.(b) $522 \times \frac{1}{3}$ or equivalent (e.g. $522 \div 0{\cdot}36 \times 0{\cdot}12$) $= 174$	M1 A1	

2.(a)	13.25	B1	
2.(b)	sixty thousand (and) forty three	B1	
2.(c)(i)	8753	B1	
2.(c)(ii)	358	B1	

7.(a) 3·12 (m)	B1	
7.(b) 9070 (m)	B1	

8.(a) 3	B1	
8.(b)(i) 	B1	A should be between 1/2 and 3/4 exclusive. B0 if no labels.
8.(b)(ii) 	B1	B should be between 1/8 and 3/8 exclusive. Award B1 if no labels and both marks are positioned correctly. [A should be between 1/2 and 3/4 exclusive.]

5(a) 481·63	B1	Do not accept 481·630
5(b) 64	B1	
5(c) 7	B1	Do not accept 7x7 or 7x7=49 alone.
5(d) (0)·03825	B1	
Ribbon mark 6(a),(b),(c),(d) 6(a) Football	B1	
Ribbon mark 6(a),(b),(c),(d) 6(b) 1/4 or equivalent ISW	B1	Do not accept incorrect notation; e.g. 1 in 4,1 out of 4, 1:4.
Ribbon mark 6(a),(b),(c),(d) 6(c) 1/4 × 60 15	M1 A1	Accept 15 out of 60. Award SC1 only, for a final answer of 15/60
Ribbon mark 6(a),(b),(c),(d) 6(d) Correctly labelled axes. Uniform scale starting from zero. Correct equal width bars for football, swimming and tennis.	B1 B1 B1	Vertical axis labelled 'number (of people)' or '*people*' or 'frequency' AND horizontal axis marked with the sports. Correct heights for 'their scale' (30 and 15) FT their (c) if possible: 'their swimming' = 'their tennis' AND either 'their football' = 2 x 'their tennis' or 'their football' = 60 – 2 x 'their tennis'. If no scale visible, allow final B1 for bars drawn in correct proportions.
7.(Number across = 20÷4=) 5 OR (Number down = 6÷2 =) 3 (Total number of small rectangles =) 5 × 3 15	B1 M1 A1	Sight of 5 or 3, not in incorrect statement or working FT 'their stated across and down' CAO
7. <u>*Alternative method*</u> *(Area rectangle A=2×4=) 8 (cm^2) OR* *(Area rectangle B=6×20=) 120 (cm^2)* *(No. of rectangle A=) 120 ÷ 8* *15*	B1 M1 A1	Sight of 8 or 120, not in incorrect statement or working FT 'their stated areas' CAO
Organisation and Communication	OC1	For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means

5.(a) Any correct total of **2**. e.g. 3 + 3 + 3 − 7	B1	B0 if any numbers other than 3 and 7 used. B0 if any operation other than + or – used. e.g. 3 × 3 is not acceptable for 3 + 3 + 3. Allow multi-digit numbers made from 3 or/and 7. e.g. 33, 37, 373 etc.
5.(b) Any correct total of **8**. e.g. 7 − 3 + 7 − 3	B1	B0 if any numbers other than 3 and 7 used. B0 if any operation other than + or – used. e.g. 2 × 7 is not acceptable for 7 + 7. Allow multi-digit numbers made from 3 or/and 7. e.g. 33, 37, 373 etc.
5.(c) Any correct total of **19**. e.g. 3 + 3 +3 + 3 +7	B1	B0 if any numbers other than 3 and 7 used. B0 if any operation other than + or – used. e.g. 4 × 3 is not acceptable for 3 + 3 + 3 + 3. Allow multi-digit numbers made from 3 or/and 7. e.g. 33, 37, 373 etc.
6.  	 B1 B1 B2	*Allow intent of drawing circles and a rectangle.* Two intersecting circles AND labelled A and B AND within a rectangle. Allow missing 'Ɛ' symbol. For unambiguous indication that the set B consists of 12, 15 and 18 only. B0 if any of these numbers are repeated outside B. All eleven numbers in correct position (with or without a rectangle), with no other or repeated numbers. B1 for six to ten numbers in correct position. Repeated numbers should not be credited. Other numbers may be ignored for this B1 mark.
7.(a) 5(2a - 3)	B1	Mark final answer.
7.(b)(i) (x =) 147	B1	Accept embedded answer. Mark final answer.
7.(b)(ii) 13f – 6f = 5 − 2 7f = 3 (f =) 3/7	 B1 B1 B1	F.T. until 2nd error. If FT leads to a whole number answer, it must be shown as a whole number. Otherwise accept a fraction. Mark final answer. Allow 0·43 or 0·429 or 0·428… as a final answer.
7.(c) '5n – 3 can be even or odd' ticked or implied AND a valid explanation given. e.g. '5×3 – 3 = 12 (even) and 5×4 – 3 = 17 (odd)' 'if n is odd you get even (but) if n is even you get odd'	E1	A valid explanation implies '5n – 3 can be even or odd', unless contradicted. Allow e.g. '15 – 3 =12, 20 – 3 = 17'. Allow a correct sequence shown e.g. 2, 7, 12, …. Do not accept 'n can be anything', 'n can be odd or even'. Do not accept an explanation that only uses 5n. e.g. '5 × 2 = 10 (even), 5 × 3 = 15 (odd)'

<table>
<tr><td>8(a) $5p$</td><td>B1</td><td></td></tr>
<tr><td>8(b) (i) (x =) 8</td><td>B1</td><td>Accept embedded answer</td></tr>
<tr><td>8(b) (ii) (y =) 15</td><td>B1</td><td>Accept embedded answer</td></tr>
<tr><td>8(c) 19</td><td>B1</td><td>Accept 4 x 19 (= 76) or 19 x 4 (= 76)</td></tr>
<tr><td>9.
<table><tr><td>23 – (4 + 2) × 3 = 5</td><td>TRUE</td><td></td></tr><tr><td>7/10 + 2/5 = 9/15</td><td></td><td>FALSE</td></tr><tr><td>½ of 1/8 = 1/4</td><td></td><td>FALSE</td></tr><tr><td>25% of 0·4 = 0·1</td><td>TRUE</td><td></td></tr><tr><td>28 – 3 × 2 + 5 = 55</td><td></td><td>FALSE</td></tr></table></td><td>B3</td><td>For all 5 correct
B2 for 4 correct.
B1 for 3 correct</td></tr>
<tr><td>10.(a)
<table><tr><td rowspan="2">Type</td><td colspan="2">Yellow</td><td colspan="2">Blue</td></tr><tr><td><100</td><td>≥100</td><td><100</td><td>≥100</td></tr><tr><td>Num.</td><td>(8)</td><td>7</td><td>4</td><td>6</td></tr></table></td><td>B2</td><td>For all three correct.
B1 for 1 or 2 correct.
If no marks awarded allow B1 for all correct tallies seen.</td></tr>
<tr><td>10.(b) Any valid statement that indicates that the numbers (in the table) are added (to make 25)
e.g. ‘add the frequency’.</td><td>E1</td><td>Allow ‘add them up’.
Allow sight of ‘8 + 7 + 4 + 6 (= 25).’</td></tr>
<tr><td>10.(c) $\frac{8}{25}$ or equivalent ISW</td><td>B2</td><td>B1 for x/25 with x<25.
B1 for 8/y with y >8.
Penalise incorrect notation -1; e.g. ‘8 out of 25’, 8:25, ‘8 in 25’.</td></tr>
<tr><td>11.(a) −3
1</td><td>B1
B1</td><td>OR FT ‘their −3’ + 4.</td></tr>
<tr><td>11.(b)(i) 21</td><td>B1</td><td></td></tr>
<tr><td>11.(b)(ii) 191</td><td>B1</td><td></td></tr>
<tr><td>11.(c) Divide (the previous number) by 3.</td><td>E1</td><td>Allow ‘÷3’.
Do not accept n÷3.</td></tr>
</table>

15. (Area of the triangle CDE =) $14 = \frac{4 \times CE}{2}$ (CE =) 7 (cm) (Area ABCE = 7 × 7 =) 49 (cm^2) (Area of whole shape = 49 + 14 =) 63 (cm^2)	 M1 A1 B1 B1	*Lengths may be shown on the diagram.* Accept equivalent e.g. 28 = 4 × CE. FT 'their stated or shown length CE'. FT 'their stated or shown area of square' + 14.
15. *Alternative method* *(Area of the triangle CDE =)* $14 = \frac{4 \times CE}{2}$ *(CE =) 7 (cm)* *(Area Trapezium ABCD =)* $\frac{[(7 + 4) + 7] \times 7}{2}$ *= 63 (cm^2)*	 *M1* *A1* *M1* *A1*	*Lengths may be shown on the diagram.* *FT 'their stated or shown length CE (=CB)' consistently as 'their 7'.*
16. (a =) $\frac{180 - 110}{2}$ or equivalent. = 35(°) b (= 180 – 90 – 35) = 55(°) c (= 90 + 55) 145(°) OR c (= 180 − 35) 145(°)	M1 A1 B1 B1	 OR FT 90 − 'their a'. OR FT 90 + 'their b'. OR FT 180 − 'their a'

	(Bearing =) 130(°)	B1	OR FT 90 + 'their x'. Must be in 3 digit form.
6.(a)	9	B1	
6.(b)	$\frac{3}{14}$ ISW	B2	B1 for x/14 if x < 14. B1 for 3/y if y>3. Penalise -1 for incorrect notation, e.g. 3 out of 14, 3 ÷ 14, 3 : 14 etc.

7.(a)(i) (x =) 8	B1	Accept embedded answer. Mark final answer.
7.(a)(ii) (x =) 14	B1	Accept embedded answer. Mark final answer.
7.(b)(i) $8n$	B1	Mark final answer.
7(b)(ii) $m - 3$	B1	Mark final answer.

16.(a)	9	B1	
16.(b)	$\frac{3}{14}$ ISW	B2	B1 for x/14 if x < 14. B1 for 3/y if y>3. Penalise -1 for incorrect notation, e.g. 3 out of 14, 3 ÷ 14, 3 : 14 etc.

20.(a)		40·5 (mm)	B1	
20.(b)	(25·5 + 25·5 =)	51 (mm)	B1	
20.(c)	(11·5 + 11·5=)	23 (mm)	B1	

WJEC GCSE MATHEMATICS

AUTUMN 2020 MARK SCHEME

GCSE Mathematics Unit 1: Foundation Tier	Mark	Comments
1. (a) Angle of 35° drawn at A	B1	Accept 33° to 37° Point alone is not sufficient.
1.(b) Circle radius 7cm (diameter 14 cm)	B1	Accept radius 6.8 (cm) to 7.2 (cm)
2.(a) 5433	B1	
2.(b) 174	B1	
2.(c) 75	B1	
2.(d) 6 × 7 ÷ 2 = 21	M1 A1	If no marks, award SC1 for sight of 42.
3.(a) 600	B1	
3.(b) 4000	B1	
4.(a) D	B1	
4.(b) S	B1	
5.(a) 9	B1	
5.(b) ÷ –	B1	
6.(a) 53	B1	
6.(b) 125	B1	
7.(a) 70 (%)	B1	
7.(b) 6 sectors shaded	B1	
8. 1/3 × 180(°) OR 2/3 × 180(°) or equivalent 60(°) OR 120(°) (180 – 60 =) 120 (°) OR (180 – 120 =) 60 (°)	M1 A1 B1	 A1 for either 60(°) OR 120(°) FT 'their 60' or 'their 120'. Two angles which add to 180(°) will get this B1. If no marks award SC1 for one angle twice the size of the other.
Alternative Method *2x + x = 180 (°) or 3x = 180 (°)* *x = 60 (°)* *2x = 120 (°)*	 M1 A1 B1	 *FT 2 × 'their x' or 180 – 'their x'*
9.(a) 16g	B1	
9.(b) (y =) 9	B1	Accept embedded answers. Mark final answer.
9.(c) (w =) 30	B1	Accept embedded answers. Mark final answer.

WJEC GCSE MATHEMATICS

AUTUMN 2020 MARK SCHEME

GCSE Mathematics Unit 1 Intermediate Tier		Mark	Comments
1.(a)	20(:)18 OR 8(:)18 p.m.	B1	B0 for (0)8:18 or 8:18 a.m or 20:18 a.m. Allow 20(:)18 p.m. and 08:18 p.m.
1.(b)	6 (hours) 40 (minutes)	B1	
1.(c)	265 (seconds)	B2	B1 for sight of 435 AND 170 OR B1 for sight of 300 AND 35 OR B1 for 4 minutes 25 seconds.
2.(a)	Line x = −4 drawn	B1	Line must be at least 2 units long. B0 if 'extra' lines drawn unless correct line unambiguously identified.
2.(b)(i)	Point C shown at (−2,−4)	B2	Allow B2 if point C not labelled but is unambiguously at the correct position (eg 'end of line') Otherwise, B1 if Point C at (−2,y) y≠3. (BÂC = 90°) SC1 for point C at (5,−4).
2.(b)(ii)	(−2,−4)	B1	FT 'their unambiguously identified position of point C'. Allow missing brackets.
3.(a)(i)	2700	B2	B1 for sight of 27 OR sight of 100. Mark final answer.
3.(a)(ii)	0·08	B1	Mark final answer
3.(a)(iii)	Correctly using a common denominator. 13 or equivalent. 18	M1 A1	Mark final answer.
3.(b)	0·05	B1	
4.	<table><tr><td>Answer</td><td>Yes</td><td>No</td><td>Not sure</td></tr><tr><td>Number of students</td><td>150</td><td>50</td><td>100</td></tr></table>	 B3	B1 for (Yes =) 150 C.A.O. B2 for (No =) 50 AND (Not sure =) 100. or FT 'their Yes' for (No =) ⅓(300 − 'Yes') AND (Not sure =) ⅔(300 − 'Yes') If B2 not gained, then B1 for (No =) 50 OR (Not sure =) 100 or FT 'their Yes' for (No =) ⅓(300 − 'Yes') OR (Not sure =) ⅔(300 − 'Yes') or B1 for 'No' + 'Not sure' = 150 or B1 if 'Not sure' = 2 × 'No'. or B1 for 'Yes' + 'No' + 'Not sure' = 300.
5.(a)	4x = 10 − 7 (=3) x = 3/4 or equivalent.	B1 B1	 FT from 4x = b. Integer answer required if b is a multiple of 4 Mark final answer. Allow an embedded answer eg 4 × 0·75 + 7 = 10 for B2, but penalise −1 if contradicted by x ≠ 0·75
5.(b)	5d − 2e	B2	Must be an expression for B2. B1 for sight of (+)5d OR sight of − 2e. B1 for 5d + − 2e. Mark final answer.
6.	a = 113 b = 67 c = 113	B1 B1 B1	C.A.O. OR FT 180 − 'their a'. OR FT = 'their a' OR FT 180 − 'their b'.
7.	AB = 13 (cm) (Area =) 13 × 13 = 169 (cm²)	B1 M1 A1	For any indication that side of square = 13 (cm). May be seen on the diagram. No FT (but note SC1). C.A.O. Unsupported 169 (cm²) gains all 3 marks. If no marks gained award SC1 for a final answer of144 (cm²)

WJEC GCSE MATHEMATICS

AUTUMN 2020 MARK SCHEME

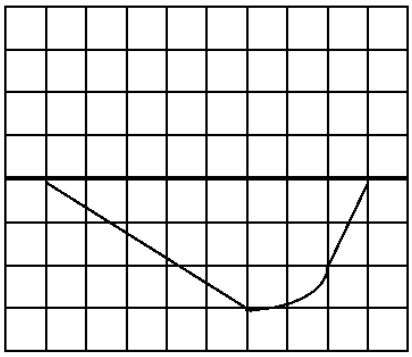
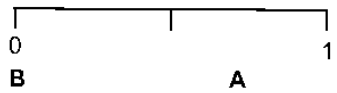
GCSE Mathematics Unit 1: Foundation Tier	Mark	Comments
1. (a) Angle of 35° drawn at A	B1	Accept 33° to 37° Point alone is not sufficient.
1.(b) Circle radius 7cm (diameter 14 cm)	B1	Accept radius 6.8 (cm) to 7.2 (cm)
2.(a) 5433	B1	
2.(b) 174	B1	
2.(c) 75	B1	
2.(d) 6 × 7 ÷ 2 = 21	M1 A1	If no marks, award SC1 for sight of 42.
3.(a) 600	B1	
3.(b) 4000	B1	
4.(a) D	B1	
4.(b) S	B1	
5.(a) 9	B1	
5.(b) ÷ –	B1	
6.(a) 53	B1	
6.(b) 125	B1	
7.(a) 70 (%)	B1	
7.(b) 6 sectors shaded	B1	
8. 1/3 × 180(°) OR 2/3 × 180(°) or equivalent 60(°) OR 120(°) (180 – 60 =) 120 (°) OR (180 – 120 =) 60 (°)	M1 A1 B1	 A1 for either 60(°) OR 120(°) FT 'their 60' or 'their 120'. Two angles which add to 180(°) will get this B1. If no marks award SC1 for one angle twice the size of the other.
Alternative Method $2x + x = 180\ (°)$ or $3x = 180\ (°)$ $x = 60\ (°)$ $2x = 120\ (°)$	M1 A1 B1	 *FT 2 × 'their x' or 180 – 'their x'*
9.(a) 16g	B1	
9.(b) (y =) 9	B1	Accept embedded answers. Mark final answer.
9.(c) (w =) 30	B1	Accept embedded answers. Mark final answer.

8. (Probability of Puffin Island=) 1 − 0·4 − 0·15 − 0·25 = 0·2	M1 A1	An unsupported answer of 0·56 implies M1
(Number of cards showing Puffin Island =) 0·2 × 80	M1	FT 'their stated P(Puffin Island)' × 80, only if 'their stated P(Puffin Island)' < 1.
= 16	A1	16/80 is M1A0 unless 16 has been seen.
Alternative method		
(Number of cards showing other 3 islands =)		
0·4 × 80 + 0·15 × 80 + 0·25 × 80 or equivalent = *64*	*M1* *A1*	*Allow M1 for sight of 32 AND 12 AND 20.*
(Number of cards showing Puffin Island =) 80 – 64	*M1*	*FT 80 − 'their derived 64', only if 'their derived 64' < 80.*
= 16	*A1*	*16/80 is M1A0 unless 16 has been seen.*
8. OCW		
Organisation and Communication.	OC1	For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means
Accuracy of writing.	W1	For W1, candidates will be expected to: • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc
9.(a) Correct construction method. e.g. (i) intersecting arcs of radii 6cm and 9cm with centres A and C respectively. OR (ii) copying the angle at B at the point A (will require AB or BA to be extended).	M1	Relevant construction arcs must be seen.
Completed parallelogram.	A1	
9.(b) 'measured length' × 200	M1	Allow for error in measuring line XY.
= 1520 (cm)	A1	Accept only in range 1480 to 1560 inclusive.
= 15·2 metres	B1	FT 'their 1520' ÷ 100. Unsupported 14·8 to 15·6 inclusive gains all 3 marks.
Alternative method		
Sight of scale is 1cm represents 2m	*B1*	
'measured length' × 2	*M1*	*Allow for error in measuring line XY.*
= 15·2 metres	*A1*	*Accept only in range 14.8 to 15.6 inclusive.*
10.(a) 9·231	B1	
10.(b) 170	B1	
10.(c) 10	B1	
11(a) 5n − 3	B2	B1 for sight of 5n. Mark final answer.
11.(b) 17	B1	
11.(c) 2n + 2 OR 2(n + 1)	B2	If 2n + 2 is not their final answer allow B1 for sight of 2n + 2 in earlier work. B1 for a correct answer not simplified or incorrectly simplified e.g. n + n + 2.

19.(a) Correct <u>construction</u> method. e.g. (i) intersecting arcs of radii 6cm and 9cm with centres A and C respectively. OR (ii) copying the angle at B at the point A (will require AB or BA to be extended). Completed parallelogram.	M1 A1	Relevant construction arcs must be seen.
19.(b) 'measured length' × 200 = 1520 (cm) = 15·2 metres	M1 A1 B1	Allow for error in measuring line XY. Accept only in range 1480 to 1560 inclusive. FT 'their 1520' ÷ 100. Unsupported 14·8 to 15·6 inclusive gains all 3 marks.
<u>Alternative method</u> *Sight of scale is 1cm represents 2m* *'measured length' × 2* *= 15·2 metres*	*B1* *M1* *A1*	*Allow for error in measuring line XY.* *Accept only in range 14.8 to 15.6 inclusive.*
20.(a) 9·231	B1	
20.(b) 170	B1	
20.(c) 10	B1	

WJEC GCSE MATHEMATICS

AUTUMN 2021 MARK SCHEME

Unit 1: Foundation Tier	Mark	Comments
1.(a) Ninety-five thousand and forty-eight	B1	
1.(b) 931	B1	
1.(c) 1250	B1	
1.(d) 208	B1	
1.(e) 1,2,3,6,9,18	B2	B1 for 4 or 5 correct and 0 incorrect B1 for 5 or 6 correct and 1 incorrect Ignore repeated numbers Accept products 1×18, 2×9, 3×6
2.(a) 94 (mm)	B1	Accept 92 to 96 (mm)
2.(b) 136(°)	B1	Accept 134 to 138 (°)
3.(a) 16	B1	
3.(b) ¾	B1	Mark final answer.
3.(c) 28	B1	
4. 	B2	B1 for correct longer straight line. B1 for correct curve AND shorter straight line. The lines must pass through the correct points.
5.(a) 4.3 x 1000 4300 (g)	M1 A1	
5.(b) 3 × 100 ÷ 6 50 (cm)	M1 A1	If M0 A0, award SC1 for sight of 300(cm) or 0.5(m).
6. 	B1 B1	A should be between 0.6 and 0.8 B should be at 0

(Larger angle =) 105(°)		angle is 90° or 0°.
7.(a) Subtract fourteen (from the previous term)	B1	Accept 'take away fourteen', 'goes down in fourteens' and '-14'. B0 for 14 alone or 'there is 14 between each number'.
7.(b) 736	B1	
7.(c) n − 14 (oe)	B1	Mark final answer

15. (a) Any n, as a whole number, which results in $7n-9$ being a multiple of 4	B2	Answer space takes precedence and must not be from incorrect working. Do not ignore crossed-out work for this question. Award B1 for any one of: • any 2 correctly evaluated terms in the sequence $7n-9$ (i.e. not leading to, or not recognised as leading to, a multiple of 4 for their choice of n) or • setting up an equation $7n-9=4\times k$ (where $k \geq 1$ and a whole number) and attempt to solve • a correct value of n substituted in $7n-9$, but contradiction or no answer given on answer line (e.g. 7×3 – 9 = 12 and 12 written on answer line or answer line left blank) Note: Award B0 for a correct value of n from incorrect working e.g. if 7 × 4 – 9 = 19, then n = 19 on the answer line.
15. (b) Any n, as a whole number, which results in $3n-5$ being a prime number	B2	Answer space takes precedence and must not be from incorrect working. Do not ignore crossed-out work for this question. Award B1 for any one of: • any 2 correctly evaluated terms in the sequence $3n-5$ (i.e. not leading to, or not recognised as leading to, a prime number for their choice of n) or • setting up an equation $3n-5$ = a prime number and attempt to solve • a correct value of n substituted in $3n-5$, but contradiction or no answer given on answer line (e.g. 3×4 – 5 = 7 and 7 written on answer line or answer line left blank) • a correct value of n substituted in $3n-5$, but n contradicted for their workings (but n still leads to a prime number) given on answer line (e.g. 3×4 – 5 = 7 and 12 written on answer line or answer line left blank). Note: Award B0 for a correct value of n from incorrect working e.g. if 3 × 4 – 5 = 13, then n = 13 on the answer line.

n	1	2	3	4	5	6	7	8	9	10	11	.....
$7n-9$	-2	5	12	19	26	33	40	47	54	61	68	.....

n	1	2	3	4	5	6	7	8	9	10	11	.....
$3n-5$	-2	1	4	7	10	13	16	19	22	25	28	.....

3. $\boxed{5}\boxed{\mathbf{3}} \times \boxed{4}\boxed{7} = \boxed{2}\boxed{4}\boxed{\mathbf{9}}\boxed{1}$	B1	

3(a) Reasonable explanation, e.g. 'no one spent longer than 80 minutes training' '1 hour 25 minutes is more than 80 minutes'	E1	Allow, e.g. 'graph only goes up to 80 (minutes)' 'only shows to 1 hour 20 minutes' 'doesn't show above 80 minutes' 'the graph doesn't extend that much' 'the bar doesn't go up to 1 hour 25 minutes' 'the bar doesn't go up to 85 minutes' 'no one spent 1 hour 25 minutes in the gym' 'the maximum he could have spent was 1 hour 20 minutes' '85 minutes was not recorded' 'goes no later than 1 hour 20 minutes' Do not accept, e.g. 'the graph only gives 20 minute time groups (slots)' 'because in a frequency graph there is no way to know who is Freddie' 'he spent 1 hour 20 minutes in the gym' 'he spent an hour in the gym' 'the graph shows he didn't spend 1 hour 25 minutes in the gym' '1 hour 25 minutes is 85 minutes'
3(b) 14	B1	
3(c) 38	B1	
3(d) (Total number of men) 14 + 22 + 48 + 16 OR (Total number of women) 12 + 26 + 54 + 22 (Total men) 100 AND (Total women) 114 Method considering proportions, e.g. sight of any of: • $\frac{48}{100}$ AND $\frac{54}{114}$ • 48% of 114 • $\frac{54}{114}$ of 100 'False' unambiguously selected or implied **and** accurate appropriate calculations to justify choice of 'False', e.g. • 48% **and** 47(.3...)% or 47.4% • 0.48 **and** 0.47(3...) • (48% of 114 =) 54.7(2) **and** 54 (women)	 M1 A2 M1 A1	Check the graphs for working FT 'their 12 + 26' from (c), i.e. 'their 38' + 54 + 22 A1 for either total correct FT 'their 48, 100, 54, and 114' providing at least two of them are correct and 'their total for men 100' ≠ 'their total for women 114' Allow 'True' if justified by correct calculations from their 4 values.

4. (Total cost of small boxes = 7 × 5 =) (£)35	B1	
(Total cost of large boxes = 59 – 35 =) (£)24	B1	FT 'their stated or derived 35'
(Cost of one large box = 24 ÷ 3 =) (£)8	B1	FT 'their stated or derived 24', provided ≠ 59 Accept follow-through answers rounded or truncated to the nearest pound, or more accurate.
Organisation and Communication.	OC1	For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means
Accuracy of writing.	W1	For W1, candidates will be expected to: • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc

4(a) 7	B1	
4(b) 9	B1	
4(c) No and valid reason given e.g. 'No because you add two onto each of the design numbers' 'No because it is the design + 2' 'No because that rule doesn't work for Design 2' 'No because Design 2 uses 4 pieces (not 6)' 'No, because for design 2, 2 × 3 = 6, design 3, 3×3 = 9 and both totals are not correct' 'No, because design 3 has 5 pieces of metal which shows it is not multiplied by 3' 'No because design 3 would be 9 and not 5' 'No because the rule is n + 2 not n × 3'	E1	Ignore any further spurious comments. Do not accept 'No, because the designs add one more piece of metal each time' 'No because you add on 1 each time' Do not accept values from incorrect number work e.g. 'No because design 3 would be 6 and not 5'
4(d) 180 – (55 + 90) or 90 - 55 35(°)	M1 A1	
4(e) (30 – 14) ÷ 2 (£)8	M1 A1	May be seen in stages Allow sight of embedded 8 for M1, e.g. • 2 × 8 + 14 = 30 • 2 × 8 = 16 + 14 = 30 Award M1 for sight of two correctly evaluated improving trials e.g. 2 × 6 + 14 = 26 AND 2 × 7 + 14 = 28 Answer line takes precedence – do not award A1 if answer line states £30 If answer line is blank, accept embedded answers provided that it is not contradicted *(e.g. if they say cost of materials is 30)*

5(a) (Gas usage 21640 – 21345 =) 295 (kWh) (Cost of gas excluding VAT) 295 × 7.2 or 295 × 0.072 2124(p) or (£)21.24 (Cost of gas including VAT) 2230(.2p) or (£)22.30(2)	 B1 M1 A1 B2	<u>Incorrect unit of money is penalised – 1 once only on the first occurrence, by withholding an A or B mark</u> FT 'their 21640 – 21345' for M1 and possible A1 FT 'their number of units' including use of 21640 or 21345 or 21640 + 21345 for M1 but A0 Treat '× 0.72' as incorrect units, allow M1 but A0 FT 'their cost of gas excluding VAT', accepting rounding or truncation to a penny B1 for one of the following: • (Cost of gas including VAT) 21(.)24 × 1.05 • (VAT) 106(.2p) or (£)1.06(2)
5(b) 13.2 × 7 + 12.2 + 12.4 (= 117) ÷ 9 13 (°C)	M2 m1 A1	M1 for sight of one of the following: • 13.2 × 7 or equivalent • 92.4 • a sum shown with a given total of 92 to 93 inclusive for 7 possible temperatures FT from M2 or from 12.2 + 12.4 + 'their sum with a total of 92 to 93 inclusive for 7 possible temperatures CAO from 117 ÷ 9 Answer space takes precedence
5(c) a = 98(°) b = 63(°) c = 117(°)	 B1 B1 B1	Answer space takes precedence FT 180 – 'their b' provided 'their b' ≠ 90° or ≠ 180°

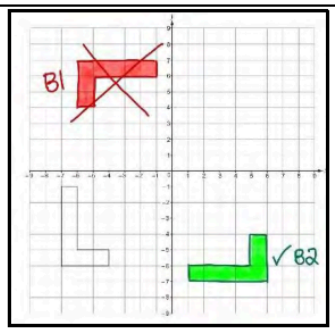
5(a) (Tax at 22%) 0.22 × 15000 or 0.22 × (25000 – 10000) or equivalent	M2	Ignore £ for € throughout M1 for appropriate sight of 25000 – 10000 (= €15000)
(Tax at 35%) 0.35 × 3000 or 0.35 × (28000 – 25000) or equivalent	M2	M1 for 28000 – 25000 (= €3000)
(Total tax due 3300 + 1050 =) 4350 (euros)	A2	CAO A1 for sight of 3300 (euros) or 1050 (euros)
(Tax still owed 4350 – 3600 =) 750 (euros)	B1	FT for positive answers only, 'their derived 4350' – 3600, provided 3300 + ... or ... + 1050 seen, i.e. sum of two amounts with at least one amount correct <u>If no marks, for special cases award one of the following:</u> (0.22 × (28000 – 3600 – 10000) =) (0.22 × (24400 – 10000) =) (0.22 × 14400 =) (€) 3168 — SC2 0.22 × (28000 – 3600 – 10000) or 0.22 × (24400 – 10000) or 0.22 × 14400 — SC1
5(b) 3600 ÷ 1.11 (£) 3243.24	M1 A1	Answer space takes precedence Sight of (£) 3243 or 3243.2(4324....) implies M1

14.(a)	11 lb	B1	
14.(b)	175 pints	B1	

15.(a) $(x =)$ $\sin^{-1}\frac{7\cdot7}{11\cdot3}$ or $\sin^{-1}\frac{7\cdot7 \times \sin 90}{11\cdot3}$ or equivalent Allow an answer between 42·8 and 43(°) ISW	M2 A1	Check diagram for answers Award M1 for one of the following: • $\sin x = \frac{7\cdot7}{11\cdot3}$ (= 0·68(1..)) • $\frac{\sin x}{7\cdot7} = \frac{\sin 90}{11\cdot3}$ or equivalent Allow correct angles given in radians or gradians: Method: $\sin^{-1}\frac{7\cdot7}{11\cdot3}$ — Radians: 0·7496… — Gradians: 47·727…. Method: $\sin^{-1}\frac{7\cdot7 \times \sin 90}{11\cdot3}$ — Radians: 0·655… — Gradians: 47·001
15.(a) *Alternative method* ***Correct** use of a 'two-step' method.* Allow an answer between 42·8 and 43(°) ISW	*M2* *A1*	*A partial trigonometric method is M0.* *Allow 42·8(…°)* *Allow correct angles given in radians or gradians.*

$DBE = (90 - 43) = 47(°)$ OR $BED = 43(°)$	B1	**Strict FT** for $DBE = 90 -$ 'their x' or $BED =$ 'their x', provided 'their x' $\neq 45°$. Note: DBE must be acute for B1. May be implied in further work.
Valid method to find the length DE $DE = 13{\cdot}1 \times \tan 47$ $DE = \frac{13{\cdot}1}{\tan 43}$ $DE = \frac{13{\cdot}1 \times \sin 47}{\sin 43}$	M2	If B1 already awarded for 'their angle DBE' but then 'their angle BED' is incorrect and 'their BED' is then used (or vice versa) for either M2 or M1, then award B0 previously. Or award M2 for correct use of a 'two-step' method (e.g. 'Pythagoras and similar triangles' or 'Pythagoras and correct trigonometric relationship'). FT 'their angle DBE' or 'their angle BED' provided not 0°, 45°, 90° or 180°. Award M1 for one of the following: • $\tan 47 = \frac{DE}{13{\cdot}1}$ • $\tan 43 = \frac{13{\cdot}1}{DE}$ • $\frac{DE}{\sin 47} = \frac{13{\cdot}1}{\sin 43}$ or equivalent For all M2 or M1 scenarios, FT their clearly stated or shown angle BED or DBE where appropriate. For $\frac{13{\cdot}1 \times \sin 47}{\sin 43}$ FT their clearly stated or shown angles BED and DBE **only** if $BED + DBE = 90°$.
DE in the range 14·04 to 14·1 (cm) ISW	A1	Allow 14 from correct workings. FT from M2 only and provided that angle is acute and leads to a positive answer. Award B1M2A0 for any of the following unsupported answers:

Method	Radians	Gradians
$13{\cdot}1 \times \tan 47$	-1·63 to 1…	11·92 to 12
$\frac{13{\cdot}1}{\tan 43}$	-8·743 to -5·36	16·35 to 16·5
$\frac{13{\cdot}1 \times \sin 47}{\sin 43}$	-1·95 to 1·08	14·1 to 14·21

20.		B2	Award B2 for the correct rotation drawn with no other shapes drawn on the grid. Award B1 for a 90° correct clockwise rotation with either: • no other shapes drawn on the grid • the correct rotation (no others).

20.(a) (AOY =) 36(°)	B1	Check diagram.
(% shaded =) $\frac{36}{360}$ (× 100) or equivalent	M1	FT 'their derived or stated angle AOY' provided not 54°. Award M0A0 for $\frac{360(°)}{36(°)}$ = 10, but award M1A1 if a final answer of 10% is seen.
= 10(%)	A1	If no marks awarded, award: • SC2 for unsupported 10% (AOY not shown or stated to be 36(°)) • SC1 for a final answer of 15% (from using 54(°)).
20.(b) Statement explaining that, 'The **tangent** at any point on a circle is **perpendicular** (or equivalent) to the **radius** at that point'.	E1	Accept unambiguous similar wording. e.g. 'Radius and tangent 90(°)'. Diameter could be used in place of radius. Must refer to tangent and radius by name (not simply AY and OA or description).

1(a) **No and** suitable reason given e.g. 'because on Friday he walked less than 10000 steps' 'because Friday is (only) 9754' 'because Friday is below 10000'	E1	Ignore spurious comments if No indicated and an appropriate reason is given. Allow the following with **no** indicated: 'because Friday is less' 'didn't walk 10000 on Friday' 'Friday didn't walk to 10000' 'Friday didn't achieve 10000' 'The first 4 days he did but the last day he only got a 4-digit number' 'because Friday was 9000' Do not allow 'Yes' indicated with a reason e.g. 'Glen has achieved his target' 'Friday is nearly 10000' 'he has achieved at least 10000 steps because 9754 is closer to 10000 than 9000 if rounded up'
1(b) 8285 (steps)	B2	Allow embedded answers such as 58285 – 8285 = 50000 Award B1 for any one of the following: • 10672 + 13586 + 12341 + 11932 + 9754 – 50000 • subtracting 50000 from an attempt at adding the 5 given values • 58285 – 50000 • 58285
1(c) 13600	B1	

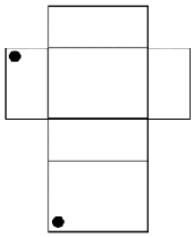
2.(a) 106000	B2	B1 for one of the following: • sight of 53000 • one hundred and six thousand • correctly doubling 'their 53 000' if it is first written in figures, provided 'their 53 000' is at least four figures and starts with the digits 5 and 3 (i.e. a place value error). • 106 followed by a minimum of two zeros
2.(b) 3600	B1	
2.(c) 42	B1	
2.(d) 1000 OR 980 OR 1030	B2	B1 for 100 × 10 OR 100 × 9·8 OR 103 × 10
2.(e) No, with appropriate working e.g. • (626 ÷ 3 =) 208 r.2 • (626 ÷ 3 =) 208·6(6…) • 6 + 2 + 6 = 14 AND 14 is not a multiple of 3 • 3 × 208 = 624 AND 3 × 209 = 627	B1	Allow No with 208·2 Arithmetic seen must be correct and show a remainder of 2 or first decimal place.

2(a) $\frac{90}{360} \times 540$ or ¼ × 540 or 540 ÷ 4 or equivalent	M1	
135 (people)	A1	Answer space takes precedence When repeatedly halving 540, if there are errors, award M0 A0 unless indication that the intention is to divide by 2, e.g. • 540 ÷ 2 = 220 (error) , 220 ÷ 2 = 110 is M1 A0 • 540, 220, 110 is M0 A0
2(b) Angle measured 170(°) ± 2(°)	B1	May be seen on the pie chart
0.4 × 170(° ± 2°) or equivalent	M1	FT for 'their angle, provided 90° < 'their angle' < 180° Any method of repeated addition must **clearly** be addition to 40%
68(°) or angle in the range 67(°) to 69 (°)	A1	Only allow angles in this range provided not from incorrect working Answer space takes precedence Allow A1 for labelled angle on the pie chart if no **final** answer given. On FT, using 'their 170', allow angles correctly rounded or truncated to the nearest degree
2(c) $540 - \frac{7}{10} \times 540$ or $(1 - \frac{7}{10}) \times 540$ or $\frac{3}{10} \times 540$	M1	For complete method
162 (not children)	A1	Answer space takes precedence If no marks, award SC1 for sight of $(\frac{7}{10} \times 540 =)$ 378

4.(a) $9{\cdot}17 \div 7 \times 3$ or equivalent 3·93 (km) 3930 (m)	 M1 A1 B1	Answer space takes precendence. May be seen in stages. FT 'their 3·93' × 1000.
4.(a) Alternative method (converting to m first) *9170 (m)* *9170 ÷ 7 × 3 or equivalent* *3930 (m)*	 *B1* *M1* *A1*	*Answer space takes precedence.* *FT 'their 9170' ÷ 7× 3 provided that the digits 917 are seen (i.e place value error).*
4.(b) $\frac{25}{2 \times 60 + 5}$ (× 100%) or equivalent = 20 (%)	M2 A1	Allow 0·2 or $\frac{1}{125 \div 25}$ or $\frac{1}{5}$ to imply M2. Award M1 for an attempt at $\frac{25}{2\ hours\ 5\ minutes}$ but with incorrect denominator (e.g. 2·5, 2·05, 2 hours 5 minutes stated incorrectly with 2 × 60 + 5 not shown). CAO Mark final answer. If no marks awarded, award SC1 for sight of 125 (minutes).
4(b). Alternative Method *125 minutes = (100%)* *12·5 minutes = 10%* *25 minutes = 20%*	 *B1* *M1* *A1*	 *CAO* *Mark final answer.*

5. 20 × 25 + 28 × 15 + 17 × 10 (= 500 + 420 + 170)	M2	M1 for either • sight of the **sum** of any 2 unique appropriate products (not multiples of these products) or • for sight of 20×25, 28×15 and 17×10
(£) 1090	A2	CAO. Answer space takes precedence FT from M2 or M1 to award A1 for either • any 2 of 500, 420 and 170 in a correctly evaluated sum of 3 products or • sight of 500, 420 and 170 **<u>If no marks</u>**, • award SC1 for sight of (Saturday and Sunday interchanged) 17 × 25 + 28 × 15 + 20 × 10 **AND** EITHER SC2 for an answer of (£)1045 OR SC1 for one of the following: • any 2 of 425, 420 and 200 in a correctly evaluated sum of 3 products • sight of 425, 420 and 200 • award SC1 for sight of (table followed in order used in Venn) 20 × 25 + 17 × 15 + 28 × 10 **AND** EITHER SC2 for an answer of (£)1035 OR SC1 for one of the following: • any 2 of 500, 255 and 280 in a correctly evaluated sum of 3 products • sight of 500, 255 and 280

			• use appropriate terminology, units, etc
7.	27 × 60 (+ 11)	M1	Sight of 1620
	(=) 1631 (seconds)	A1	

13.(a) 	B2	Accept any indication. Award B1 for one of the following: • one correct dot with no more than one incorrect dot shown • two correct dots with one incorrect dot shown.
13.(b) $3 \times 5 \times p = 90$ or $90 \div (3 \times 5)$ or equivalent $(p =)$ 6	M1 A1	M1 for complete method. Allow M1A1 for a correct embedded answer (e.g. $3 \times 5 \times 6 = 90$), BUT M1A0 if contradicted by $p \neq 6$). Unsupported 6 is awarded M1A1.

Unit 2: Intermediate Tier		Mark	Comments
1.(a)	$x = 100$	B1	Mark final answer. Allow B1 for a correct embedded answer BUT B0 if contradicted by $x \neq 100$.
1.(b)	$7m = 28$ $m = 4$	B1 B1	FT from $7m = k$. Unsupported answer of 4 is awarded B1B1. $m = \frac{28}{7}$ is awarded B1B0. If FT leads to a whole number answer, it must be shown as a whole number. Otherwise accept a fraction or decimal (e.g. if $7m = 34$, then $m = \frac{34}{7}$ is awarded B0B1, but m = 34÷7 is awarded B0B0). Allow B1B1 for a correct embedded answer BUT only B1B0 if contradicted by $m \neq 4$.

Unit 2: Foundation Tier	Mark	Comments
1.(a) Suitable explanation e.g. 'Morgan has added £99 (and not 99p)' 'the units are different' 'Morgan has added pence and pounds' 'Morgan typed in 99 not 0.99' 'Didn't put 0. in front of 99'	E1	Allow: 'Morgan has forgotten the decimal point for the 99 pence' 'Didn't put the dot in front of 99' 'Adds them all up instead of putting 0 in front of 99p' 'he didn't put decimal place he added as whole numbers' *'numbers added together with decimal point after the number (99)'* 'Morgan added £98.01 onto the actual cost' '2.70 + 0.99 + 1.30 + 1.95 + 7.49 (=14.43)' 'he forgot that it was 99p' 'didn't use 99p for bananas' 'Morgan has forgotten to put one of the decimal places in' Do not accept: 'he added them up incorrectly' 'it should be (£)14.43' 'he put 99 when it should be 9.9' '2.70 + 99p + 1.30 + 1.95 + 7.49 = £14.43' 'he has not made the 99p £1' 'he didn't use his calculator' 'he didn't put the dot in' 'he put the decimal in which made it a higher number it = £14.43' (not clear enough)
1. (b) 20 – (2.70 + 0.99 + 1.30 + 1.95 + 7.49) or equivalent (£)5.57	M1 A1	(£)20 – (£)14.43 Allow 14.43 - 20 Accept 2.70 + 99 + 1.30 + 1.95 + 7.49 seen if it leads to the correct answer. FT 'their 14.43' if clearly stated in (a) and is <20 for M1 only. CAO If no marks awarded, award SC1 for sight of (£)14.43. May be seen on shopping list or in part (a).

2(a) 15(:)00 or 3 p.m.	B1	Allow 15(:)00 pm, 3(:00) or 3 o'clock Do not accept 15(:)00 am, 3 a.m, 03:00 (p.m)
2(b) 14 (km)	B1	
2(c) 12:00 to 12:30	B1	

Unit 2: Foundation Tier	Mark	Comments
4(a) (Deal A =) (£)19.99 + (£)28.99 × 24 **AND** (Deal B =) (£)100(.00) + (£)24.36 × 24	M3	Award M2 for any one of the following • (Deal A =) (£)19.99 + 28.99 × 24 • (Deal B =) (£)100(.00) + 24.36 × 24 Award M1 for any one of the following: • Sight of (£)28.99 × 24 or (£)695.76 • Sight of (£)24.36 × 24 or (£)584.64 • Sight of (£)1175.52 (BIDMAS error Deal A) • Sight of (£)2984.64 (BIDMAS error Deal B)
(Deal A =) (£)715.75 **AND** (Deal B =) (£)684.64	A1	CAO If M0A0 awarded, award SC1 for any one of the following: (19.99 + 29 × 24=) (£)715.99 (20 + 28.99 × 24=) (£)715.76 (20 + 29 × 24=) (£)716 (100 + 24.4(0)× 24=) (£)685.6(0) (100 + 24 × 24=) (£)676
Deal B (is cheaper by) **AND** (£)31.11	B1	FT the difference between 'their **derived** Deal A' and 'their **derived** Deal B' **with** 'their cheaper' deal stated provided at least one mark previously awarded. **Note:** For use of 12 months instead of 24 months award: SC1 for sight of (19.99 + 28.99 x 12 =) (£)367.87 SC1 for sight of (100 + 24.36 x 12 =) (£)392.32. B1 for the correct conclusion with the correct difference on follow-through (Deal A AND (£)24.45) provided at least one mark awarded.
4(a) Alternative method for difference *(Monthly payments difference =)* *[(£)28.99-(£)24.36] × 24 or equivalent*	*M1*	*(695.76 – 584.64)*
(Deal B cheaper by =) (£)111.12	*A1*	
(One off payments difference=) (£)100(.00) - (£)19.99 *(Deal A is cheaper by =) (£)80.01*	*M1* *A1*	*If M0A0 M0A0 awarded, award SC1 for any one of the following:* *(£) 31.35 from (29 – 24.36) × 24 - (100 – 19.99)* *(£) 31.36 from (29 – 24.36) × 24 - (100 – 20)* *(£) 30.15 from (28.99 – 24.40) × 24 - (100 – 19.99)* *(£) 30.16 from (28.99 – 24.40) × 24 - (100 – 20)* *(£) 39.75 from (28.99 – 24) × 24 - (100 – 19.99)* *(£) 39.76 from (28.99 – 24) × 24 - (100 – 20)* *(£) 39.99 from (29 – 24) × 24 - (100 – 19.99)* *(£) 40 from (29 – 24) × 24 - (100 – 20)* *(£) 30.39 from (29 – 24.40) × 24 - (100 – 19.99)* *(£) 30.4(0) from (29 – 24.40) × 24 - (100 – 20)*
*Deal B (is cheaper by) **AND** (£)31.11*	*B1*	*FT the difference between 'their **derived** monthly payments difference' **and** 'their **derived** one-off payment difference' with correct conclusion provided at least one mark previously awarded.* ***Note:** For use of 12 months instead of 24, award:* *M1 for 100 – 19.99* *A1 for (£)80.01* *SC1 for sight of (28.99 x 12 - 24.36 x 12) (£)55.56 and the correct conclusion with the correct difference on follow-through (Deal A and 24.45)*

Unit 2: Foundation Tier	Mark	Comments
Organisation and communication	OC1	For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanations and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means
Writing	W1	For W1, candidates will be expected to: • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc.
4(b) A line of 12·8cm (±2mm) (or a point) in a correct position drawn within the angle tolerance (±2°)	B2	If 2 'vertical lines' given, mark the line that gains the most marks from the first B2 Award B1 for any one of the following: • a line drawn (or point indicated) of length 12·8cm (±2mm) in a correct position but out of the angle tolerance (±2°) • a line drawn from the given line (or point indicated) of length 12·8cm (±2mm) within the angle tolerance (±2°) but not in a correct position
Screen size = 14·3 cm (±2mm) OVERLAY	B1	Strict FT from their diagram. If B2 previously awarded, then award the final B1 provided: • 'their diagonal' is measured correctly (± 2 mm) (may need to check both diagonals) AND • this measurement lies between 13.9 and 14.7 cm (i.e. 14.3 cm ± 4 mm). If B1 or B0 previously awarded, award the final B1 for 'their diagonal' measured correctly (±2mm) (may need to check both diagonals) Answer must be given in cm **and** to 1 decimal place for B1 Award SC1 for an answer of 14.3 (cm) from use of Pythagoras' Theorem.

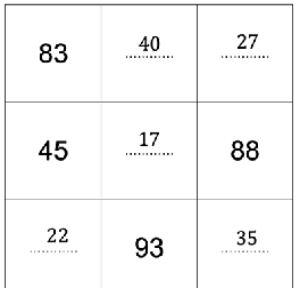
5(a) 15(:)00 or 3 p.m.	B1	Allow 15(:)00 pm, 3(:00) or 3 o'clock Do not accept 15(:)00 am, 3 a.m, 03:00 (p.m)
5(b) 14 (km)	B1	
5(c) 12:00 to 12:30	B1	

6. (Tax on first 15000 euros) 0.2(0) × 15000 (Tax on remaining income) 0.3(0) × (26000 – 15000) (Total income tax) 6300 (euros)	M1 M2 A2	Ignore £ written for euros (= 3000 euros) (= 3300 euros) M1 for (Remaining income to be taxed) 26000 – 15000 (= 11000 euros) Ignore any further working (such as to calculate income – income tax) A1 for either part of the tax correctly evaluated, i.e. (0.2(0) × 15000 =) 3000 (euros) or (0.3(0) × (26000 – 15000) =) 3300 (euros)

Unit 2: Foundation Tier	Mark	Comments
12.(a) 1740 (minutes)	B2	Answer line takes precedence. Award B1 for sight of one of the following: • 24 × 60 + 5 × 60 • 24 × 'their 60' + 5 × 'their 60' • 'their 24 × 60' + 5 × 60 • 29 × 60 • 29 × 'their 60' • 'their 24 + 5' × 60 • 1440 (24 × 60) • 300 (5 × 60) • 104 400 (seconds). An unsupported answer of 1740 (minutes) is awarded B2.
12.(b) Sight of 6·3 OR 630	B1	
0·46 (m) OR 46 (cm)	B2	**If units given, they must be correct.** Mark final answer. FT 6.76 – 'their 6.3' provided 6.2 ≤ 'their 6.3' ≤ 6.4 **OR** 676 – 'their 630' provided 620 ≤ 'their 630' ≤ 640. Award B1 for one of the following: • 6·76 − 6·3 • 676 – 630. An unsupported answer of: • 0·46 or 46 is awarded B1B2 (if units given, they must be correct) • 0·46 cm or 46 m is awarded B1B1.
13.(a) Correct cuboid	B2	Ignore orientation of cuboid. For B2, their cuboid must have edges of correct length along or parallel to the 3 directions usually associated with isometric paper (the two diagonals and the vertical). Award B1 for any one edge dealt with correctly for all its three visible occurrences in a cuboid. For any mark to be awarded the line must go 'through the dots' AND have both ends 'on a dot'. Ignore attempt at handling 'hidden lines'. If no marks, award SC1 for a correct 'isometric' cuboid drawn with dimensions 6cm by 4cm by 2cm (counting dots) in any orientation.
13.(b) (Volume =) 7 × 5 × 3	M1	M1 must be for a complete correct method. e.g. any further manipulation to 7 × 5 × 3 is M0.
= 105	A1	CAO Unsupported final answer of 105 is awarded M1A1U0.
cm^3	U1	Independent of other marks (e.g. M0 could have been previously awarded or no volume given). Unsupported answer of 105cm^3 is awarded M1A1U1.

2(a) 30 000 or thirty thousand or 30 thousand	B1	ISW Accept 'ten thousands' or 'tens of thousands' Do not accept 10 000 or 'ten thousand'.
2(b) 1364	B1	
2(c) 382	B1	

3(a) 20 (students)	B1	
3(b) 4 (students)	B1	
3(c) 91 (students)	B1	Answer space takes precedence
3(d) 21 (students)	B1	Answer space takes precedence
3(e) Drums AND 23 (students)	B1	Answer space takes precedence

numbers 7 or more		
4. 	B3	B2 for either: • 2 rows with a total of 150 • 2 columns with a total of 150. B1 for either: • 1 row with a total of 150 • 1 column with a total of 150.

4(a) 20 ≤ time in minutes < 30	B1	Allow e.g. '20 to 30' '20 – 30' '20 < time < 30' '20 ≤ time ≤ 30' '20 < time ≤ 30' '12 pupils for 20 to 30 minutes' (implies the group) '12 pupils in 20 – 30 minutes' (implies the group) '12 (pupils), 20 – 30 minutes' (2 answers side by side, mark the right-hand attempt) Sight of 20 and 30 with incorrect inequality signs, e.g. '20 ≤ 30' Do not accept, e.g. '12' '25' '20 – 30 minutes, 12 (pupils)', (as a choice of answers, mark the right-hand attempt)
4(b) 15	B1	
4(c) Unambiguously indicates 'Can't tell' with a reason, e.g. 'doesn't give the raw data (for the group 0 to 10 minutes)', 'only know (frequency) for the group 0 to (less than) 10 minutes' '5 pupils spent less than 10 minutes, but the diagram doesn't show if any of these spent no time' 'it doesn't tell you exactly how many minutes each pupil spent individually'	E1	Allow 'Can't tell' with a reason such as, e.g. 'grouped data', 'data is grouped' 'it is given in a range on the diagram' 'it doesn't show specifically' 'graph is not specific' 'it doesn't given an exact time' 'the graph gives 0 to 10 minutes making it impossible to get an accurate reading' 'could be 1 minute each or 5 minutes each we don't know' (examples all within the group 0 ≤ time < 10) 'doesn't give the data for 0 minutes' 'because the group is from greater than or equal to 0 minutes to less than 10 minutes' 'graph does not say they did or not' 'we can't see this on the diagram' 'does not give enough data' Do not accept reasons that imply 0 minutes is not included in the diagram Do not accept, 'Can't tell' e.g. 'the groups are an estimate' 'could be 5 minutes each or 20 minutes each we don't know' (examples not all within the required group) 'because the group is from greater than 0 minutes to less than 10 minutes' 'doesn't tell us how many people there are'

4(d) Unambiguously indicates 'No' with a reason, e.g. 'it is the same number (both 5 pupils) but different number of Year 9 asked to Year 10', 'the totals are different', 'Year 9 percentage is lower (than Year 10)' '5/34 is not the same (percentage) as 5/33' 'there are more pupils in Year 9 (than in Year 10)' 'there are fewer pupils in Year 10 (than Year 9)'	E1	Check diagram for totals If 'totals are different' is stated or clearly implied, ignore any incorrect totals or fractions given, provided the numerator of 5 pupils is correct Alllow 'No' with a reason, e.g. 'the difference is 1' OR Allow 'No' with sight of total 34 for Year 9 and 33 for Year 10 Do not accept, e.g. 'because the results are different' 'the difference is 2' 'there are more pupils in Year 10 (than in Year 9)', unless the correct totals are seen 'there are fewer Year 9 (than Year 10)', unless the correct totals are seen

5(a) 45 (minutes)	B1	Do not accept 0.75 hours Answer space takes precedence
5(b) 15:00	B1	
5(c) 25 (km)	B1	Answer space takes precedence
5(d) 9 (minutes)	B1	Allow 8.5 to 9.5 minutes Answer space takes precedence

7.(a) $\frac{1}{2}$ or $\frac{180}{360}$ or 50% or equivalent	B1	ISW Allow (a) half BO for answer using words alone with no numerical value; e.g. 'even chance' alone.
7.(b) 2×45 90	M1 A1	FT from 45 ÷ 'their (a)'
7.(c) $\frac{60}{360}$ or $\frac{1}{6}$ or $\frac{15}{90}$ or equivalent	B2	ISW B1 for sight of 360° as a denominator.

7(a) 20 ≤ time in minutes < 30	B1	Allow e.g. '20 to 30' '20 – 30' '20 < time < 30' '20 ≤ time ≤ 30' '20 < time ≤ 30' '12 pupils for 20 to 30 minutes' (implies the group) '12 pupils in 20 – 30 minutes' (implies the group) '12 (pupils), 20 – 30 minutes' (2 answers side by side, mark the right-hand attempt) Sight of 20 and 30 with incorrect inequality signs, e.g. '20 ≤ 30' Do not accept, e.g. '12' '25' '20 – 30 minutes, 12 (pupils)', (as a choice of answers, mark the right-hand attempt)
7(b) 15	B1	

7(c) Unambiguously indicates 'Can't tell' with a reason, e.g. 'doesn't give the raw data (for the group 0 to 10 minutes)', 'only know (frequency) for the group 0 to (less than) 10 minutes' '5 pupils spent less than 10 minutes, but the diagram doesn't show if any of these spent no time' 'it doesn't tell you exactly how many minutes each pupil spent individually'	E1	Allow 'Can't tell' with a reason such as, e.g. 'grouped data', 'data is grouped' 'it is given in a range on the diagram' 'it doesn't show specifically' 'graph is not specific' 'it doesn't given an exact time' 'the graph gives 0 to 10 minutes making it impossible to get an accurate reading' 'could be 1 minute each or 5 minutes each we don't know' (examples all within the group $0 \leq$ time < 10) 'doesn't give the data for 0 minutes' 'because the group is from greater than or equal to 0 minutes to less than 10 minutes' 'graph does not say they did or not' 'we can't see this on the diagram' 'does not give enough data' Do not accept reasons that imply 0 minutes is not included in the diagram Do not accept, 'Can't tell' e.g. 'the groups are an estimate' 'could be 5 minutes each or 20 minutes each we don't know' (examples not all within the required group) 'because the group is from greater than 0 minutes to less than 10 minutes' 'doesn't tell us how many people there are'
7(d) Unambiguously indicates 'No' with a reason, e.g. 'it is the same number (both 5 pupils) but different number of Year 9 asked to Year 10', 'the totals are different', 'Year 9 percentage is lower (than Year 10)' '5/34 is not the same (percentage) as 5/33' 'there are more pupils in Year 9 (than in Year 10)' 'there are fewer pupils in Year 10 (than Year 9)'	E1	Check diagram for totals If 'totals are different' is stated or clearly implied, ignore any incorrect totals or fractions given, provided the numerator of 5 pupils is correct Alllow 'No' with a reason, e.g. 'the difference is 1' OR Allow 'No' with sight of total 34 for Year 9 and 33 for Year 10 Do not accept, e.g. 'because the results are different' 'the difference is 2' 'there are more pupils in Year 10 (than in Year 9)', unless the correct totals are seen 'there are fewer Year 9 (than Year 10)', unless the correct totals are seen

7(a) 20 (students)	B1	
7(b) 4 (students)	B1	
7(c) 91 (students)	B1	Answer space takes precedence
7(d) 21 (students)	B1	Answer space takes precedence

10(a)(i) States 80 (and) 100 (seconds) AND indicates 'Yes'	B1	Allow written as 100 and 80 Answer space takes precedence
10(a)(ii)I. (80 – 75 =) 5 (seconds)	B1	Not from incorrect working Answer space takes precedence
10(a)(ii)II. Answer in the inclusive range 12 to 14 (seconds)	B2	Allow in this range only provided it not from incorrect working Answer space takes precedence B1 for sight of 92 – 60 (– 20) to 94 – 60 (– 20) or 32 (–20) to 34 (– 20)

10(b) 96 (seconds)	B3	Answer space takes precedence B2 for sight of or indication of 64 (squirrels), B1 any one of the following: • for sight of or indication of 16 (squirrels) • (use of 16 squirrels) answer of 52 (seconds) B0 for 64 seconds from incorrect working, 20% of 120 = 24, with time 64 seconds B0 for 96 seconds from incorrect working, 80% of 120 = 96, with time 96 seconds
10(c) (24 ÷ 21500) × 1000000 (squirrels per km^2)	M2	Accept using estimation: (24 ÷ 20000) × 1000000 M1 for any one of the following, including if embedded: • 24 ÷ 21500 (= 0.001116… squirrels per m^2) • (estimate) 24 ÷ 20000 (= 0.0012 squirrels per m^2) • 1000000 ÷ 21500 (= 46.5….) • (estimate) 1000000 ÷ 20000 (= 50)
1116(.27...) (squirrels per km^2) AND Conclusion indicated or unambiguously implied 'Oak'	A1	Accept 1200 from estimating, i.e. (24 ÷ 20000) × 1000000 =1200 (squirrels per km^2) If no marks, award SC1 for appropriate sight of a calculation of 24 ÷ 'a number with only non-zero digits 215', provided not embedded in further working apart from multiplication or division by powers of 10
10(c) Alternative method *(If **oak**, number of squirrels likely in Maesgwyn Forest) 21 500 × 1200 ÷ 1000000*	*M2*	*Allow M2 for (If chestnut) 21 500 × 100 ÷ 1000000 (= 2.15)* *or (if pine) 21 500 × 45 ÷ 1000000 (= 0.9675)* *M1 for any one of the following, including if embedded:* • *(if oak) 21 500 × 1200 (= 25800000)* • *(If chestnut) 21 500 × 100 (= 2 150000)* • *(if pine) 21 500 × 45 (= 967 500)* • *21 500 ÷ 1000000 (= 0.0215)* • *20000 ÷ 1000000 (= 0.02)*
25.8 (squirrels) AND 'Oak' indicated as conclusion	*A1*	*Allow from correct working either* *2.15 (squirrels for Chestnut so must be) Oak, or* *0.9675 or 1 (squirrels for Pine so must be) Oak* *If no marks, award SC1 for appropriate sight of **any 1** of the following calculations:* • *'a number with only non-zero digits 215' × 1200* • *'a number with only non-zero digits 215' × 45* *provided not embedded in further working apart from multiplication or division by powers of 10*

11(a) 76 (g)	B1	Answer space takes precedence
11(b) 3 × 400 × 25 ÷ 100 or ¾ × 400 or equivalent 300 (little gulls)	M1 A1	If no marks, award SC1 for (¼ × 400 =) 100 (gulls)
11(c) 25(%)	B1	Answer space takes precedence
11(d)(i) Slender(-billed gulls)	B1	
11(d)(ii) Lower quartile	B1	Strictly depends on B1 previously awarded in (d)(i)

16.(a) Sight of $x^2 + 8x + 15 = 120$ (leading to $x^2 + 8x - 105 = 0$)	B2	Must be convincing. Award B1 for one of following: • $(x + 5)(x + 3) = 120$ • $x^2 + 5x + 3x + 15$ • $x^2 + 8x + 15$ • $x^2 + kx + 15 = 120$ $(k \neq 0)$ • $x^2 + 8x + k = 120$ $(k \neq 0$ or $-105)$.
16.(b) $(x + 15)(x - 7)$ $(x =) -15$ AND $(x =) 7$	B2 B1	May be seen in part (a) or (c), provided not contradicted in (b). Award B1 for one of the following: • $(x \ldots 15)(x \ldots 7)$ • two brackets which multiply to give $x^2 + 8x + k$ but not $(x + 5)(x + 3)$ • two brackets which multiply to give $x^2 + kx - 105$. Mark final answer. **Strict FT** from their brackets, provided not from $(x + 5)(x + 3)$. If no factorising shown, allow the following: B2 for $x + 15\ (=0)$ AND $x - 7\ (=0)$ (B1) $(x =) -15$ AND $(x =) 7$ (B1) B1 for $x - 15\ (=0)$ AND $x + 7\ (=0)$ (B0) $(x =) 15$ AND $(x =) -7$ (B1) FT B1 if only $(x =) -15$ AND $(x =) 7$ seen. (B1)

16.(c)		Allow dimensions and/or justification to be seen in part (a) or (b), provided not contradicted in (c). Answer lines take precedence.
Length = 12 (cm), Width = 10 (cm)	B1	FT 'their 7' + 5 and 'their 7' + 3 provided • one x value from (b) > -3 **AND** one x value from (b) < -3 • both length and width are positive. If not on answer line, must clearly be length and width. Unsupported answers are awarded B1.
Statement about ignoring $x = -15$ **as it leads to negative lengths** or that x must be > -3.	E1	Allow "you can't have a negative length (on the rectangle)" "the width can't be negative" Do not accept incorrect or vague explanations e.g. "x can't be negative" "x must be positive" "it can't be negative".

End of solutions