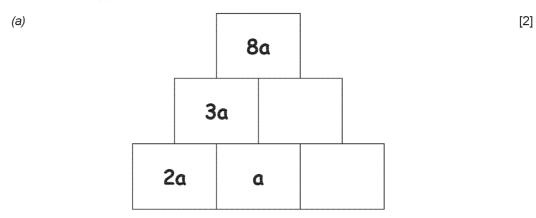
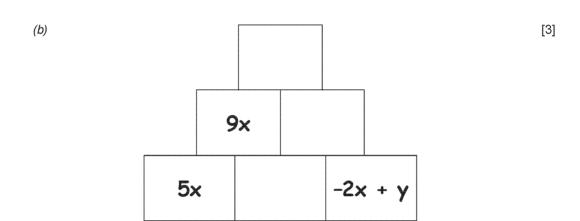
To fill in a block, you must add the values on the two blocks directly below it. Some values are already displayed.
Fill in the empty blocks.
You must simplify your answer.





2. (a) Simplify 7x + 5y - 3x - 2y. [2]

(b) Given that e = 4f - 5, find the value of e when f = 3. [2]

(a)	Simplify $a + 3b + a - 4b$.	[2]
(b)	Rebecca thinks of a number. She multiplies the number by 4 and subtracts 7 to get 41. What was her number?	[2]
(c)	An apple and a pear are placed on a scale, as shown in Diagram 1. Another apple is added to the scale, as shown in Diagram 2. Both apples have the same weight.	

What is the weight of the pear?

[4]

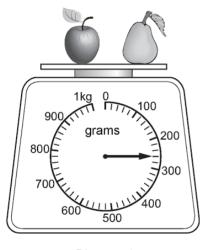


Diagram 1

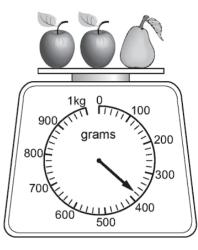


Diagram 2

(a)	(a) Write down the next term in each of the following sequences.								
	(i)	15,	21,	27,	33,				
	(ii)	62,	56,	51,	47,				
		• • • • • • • • • • • • • • • • • • • •							
		•••••			***************************************				
						3			
(b)	Des	cribe, in wor	ds, the rule	for continuir	g the seque	ence 48, 12, 3, $\frac{3}{4}$,	[1]		
•••••							•••••		
(c)	Find t	the value of	p = 3a + 4b	-6c when	$a = 2 \ b = 3$	and $c = -1$	[2]		
(0)	i iii G	ine value of	p = 3a + 4o	- oc whom	a – z , o – o	i di i di C — 1.	[2]		
	***********						******		
••••••	************			••••••	***************************************		******		
•••••	••••••								
(d)	Simp	olify $5x + 2x$	-3x.				[1]		



5. (a) Simplify 3x + 5y + x - 7y.

[2]

(b) Solve

(i) $\frac{y}{6} = 12$,

[1]

(ii) 7x - 8 = 20.

[2]

(c) Here is a number machine.

INPUT ADD 4 MULTIPLY BY 5 OUTPUT

Write down the OUTPUT when the INPUT is n.

[2]

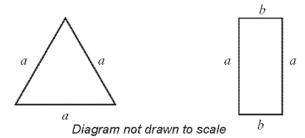
6. Write down the next number in this sequence. [1] (a) 100, 93, 86, 79, (b) Solve these equations. (i) 3x = 60[1] (ii) y + 19 = 26[1] Simplify 5p + 6p - 8p. [1] (c) (d) Here is a number machine. INPUT SUBTRACT 9 DIVIDE BY 4 OUTPUT Write down the OUTPUT when the INPUT is 1. [1]

7.	Solve each of the following equations. (a) $x-4=3$	
	(b) 4x = 36	[1]
	(6) 4x = 30	
	(c) $5x - 4 = 31$	[1]
		[2]
8.	Solve the equation $8a + 7 = 2a + 34$.	[3]

(a)	Solv	$e \frac{x}{7} = 7.$	[1]
	•••••••		
(b)	Solv	y = 5y - 6 = 49.	[2]
(c)	(i)		[2]
	(ii)	Use your answers to find the value of $2x + 3y$.	[2]



The perimeter of the triangle is 30 cm.
The perimeter of the rectangle is also 30 cm.



Use this information to find the area of the square below.



Diagram not drawn to scale

04>4.	 	 	 *****	 *****	*****	 	*****	*****	••••	*****	 	 	 	 ****	 	*****	 *****	 *****	*****	*****		
																					••••••	
																					•••••	

Area of the square = cm²

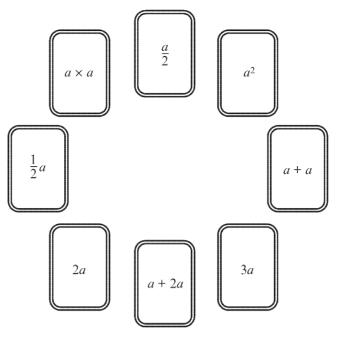
[4]

11.	(a) Solve the following equation.	[3]
	2(30 - x) = 44	
	(b) Simplify $3(4a-2c)-2(2a+4c)$.	[2]
	(c) Find all integer values of n that satisfy the inequality. $5\leqslant 3n<18$	[3]
12.		
	(a) Solve $\frac{x}{2} + 18 = 26$.	[2]
	(b) Expand $y(y^2 + 4)$.	[2]

Solve the equation $3(x-2) = x + 2$.	[3]

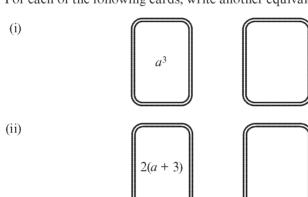


14. Sammy and Jack play snap with these algebra cards.



(a) Draw lines to connect the pairs of cards that are equivalent.

(b) For each of the following cards, write another equivalent card.



[2]

[4]

(a)	Simplify $x + 2x + 5x$.	[1]

(b) Simplify
$$10a + 7b - 12a + 2b$$
. [2]

(c)	Find the value of	10x + 3y, when	x = -4 an	y = 5.	[2]

(d) Expand
$$2x(3y + 7)$$
. [2]

(e) Factorise 10ab - 25a. [2]

$$6c+3$$
 $3c+6$ $3c$

$$c + 3$$
 6($c + 3$)

$$\frac{c+3}{6} \qquad \qquad 3(c+6) \qquad \qquad \frac{c}{6} + 3$$

Fill in the table below to match each statement with one of the expressions given above. [4]

STATEMENT	EXPRESSION
Three times a number \emph{c}	
Add 3 to a number \emph{c} and then multiply this total by 6	
Three times a number \emph{c} and then add 6	
Add 3 to a number c and then divide this total by 6	

In the following table, the letters a, b, c and d represent different numbers. The total for each row is given at the side of the table. Find the values of a, b, c and d.

а	а	а	а	16
а	b	b	а	18
а	с	c	c	13
а	b	c	d	14

a = b =	c =	d =
		[4]

10.	(a) Solve the equation $2x - 5 = 11$.	[2]
	(b) Given that $A=4B+6C$, calculate the value of C when $A=42$ and $B=3$.	[3]
19.	Use the formula $M = 4A - 6B$ to find the value of M when $A = 8$ and $B = 3$.	[2]

(a)	(i)	A magazine costs £ m . Write down, in terms of m , the cost of 6 magazines.	
	(ii)	Louise weighs x kg. Imrana is 4 kg lighter. Write down, in terms of x , Imrana's weight.	[1]
(b)	Find	If the value of $7x + 3y$ when $x = -2$ and $y = 4$.	[1]
(c)	Solv	e 5x - 3 = 17.	[2]
(d)	Here	e is a number machine.	[2]
IN	PUT Writ	SUBTRACT 4 DIVIDE BY 6 OUTPUT te down the OUTPUT when the INPUT is n.	
			[2]

21. You will be assessed on the quality of your written communication in this question.

A computer technician takes 45 minutes to service a computer.

She charges using the following formula:

Charge = £30 \times number of hours worked + total cost of parts

Calculate the charge for servicing 8 computers when the total cost of parts was £65.	[6]

	•••••

	47776000

	•••••

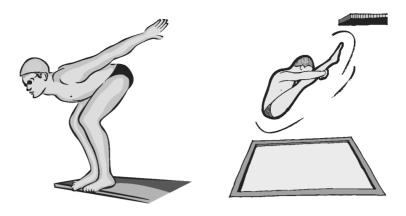
A landscape gardener is asked by the owner of a caravan park to plant some trees on the site.

To work out the total bill, the gardener uses the formula

total bill = time taken in hours × £10 + total cost of the trees.

The gardener bought 24 trees at a price of £5 each. It took the gardener a quarter of an hour to plant each tree. Calculate the total bill.								





In a diving competition, the final score for a dive depends on:

- the degree of difficulty of the dive;
- the total of the marks awarded by 5 judges.

The formula for working out the final score is shown below.

Final score = $0.6 \times degree$ of difficulty x total of the judges' marks

(a)	Tim does a dive with a degree of difficulty of 3.8. The judges' marks have a total of 32.5. What is the final score for Tim's dive?	
(b)	For Tim to win the competition he will need a score of 100·8 from his final dive. Tim's final dive has a degree of difficulty of 4·2. For Tim to score 100·8, what does the total of the judges' marks need to be?	[2]
		[2]

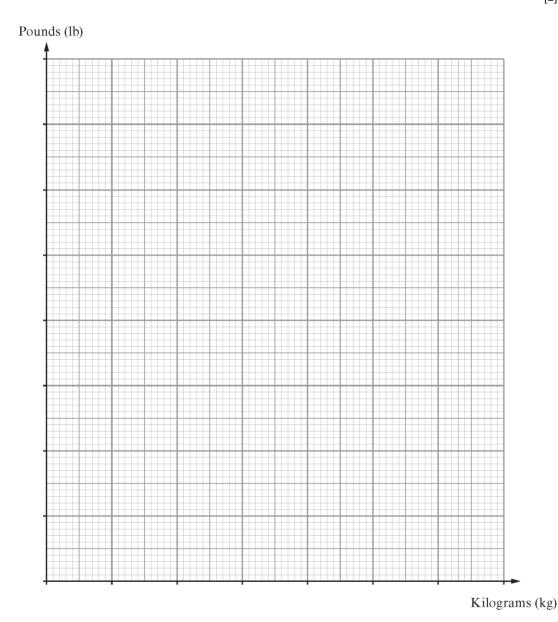


In a hospital clinic the following information is used to convert between kilograms (kg) and pounds (lb).

Kilograms (kg)	0	39	68
Pounds (lb)	0	86	150

(a) Use the information in the table to draw a conversion graph.

[2]



(b) Use your graph to find an estimate for 50 kilograms in pounds.

(c) Find an estimate for 200 pounds in kilograms.

.....

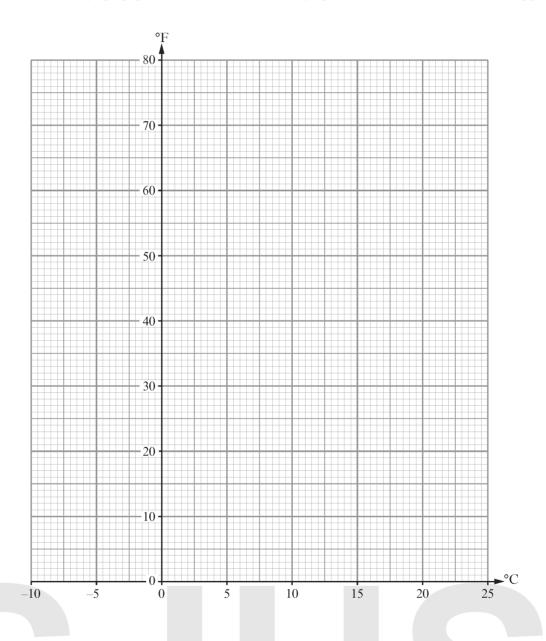
[2]

[1]

The table below gives three temperature readings, both in Celsius (°C) and in Fahrenheit (°F).

°C	-5	5	25
°F	23	41	77

(a) On the graph paper below, draw a conversion graph between °C and °F. [3]



(b)	Water freezes at 0 °C under normal conditions. Use your graph to find the temperature, in °F, at which water freezes under normal conditions.	nal
***************************************		[1]
(c)	Which is the higher temperature, 60°F or 18°C? You must give a clear reason for your answer.	
***************************************		******
		•••••
		[1]

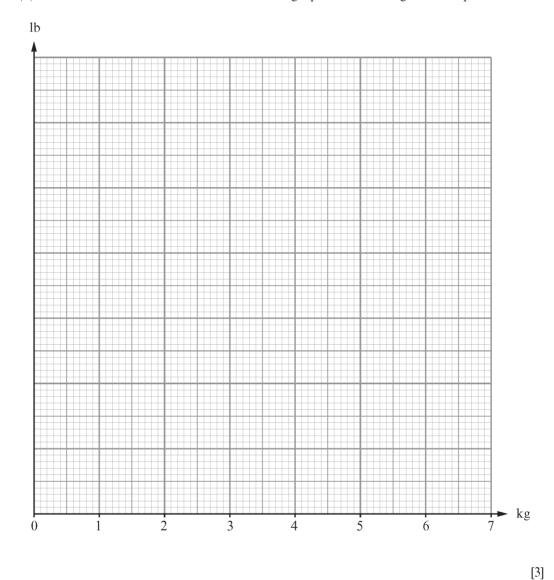


The following two pieces of information, given in both kilograms (kg) and pounds (lb), were seen in a cookery magazine.

Use 5 kg (11 lb) of apples. Wash and peel them.

Use 2 lb (0.9 kg) of sugar. Warm the sugar before use.

(a) Use the information to draw a conversion graph between kilograms and pounds.



(b)	A narcon	wainhe	Metona	(1 stone =	1/116
(D)	A person	weigns	iustone.	α stone =	-14 ID.I

Use your graph to estimate the weight of this person in kilograms. Remember to show the method you have used.

		[3]

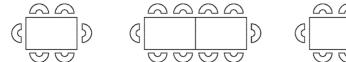
28. Find the *n*th term of the following sequences.

	••••	43,	33,	23,	13,	3,	(a)
[2							
				30,			, ,

[2]

[2]

Seating arrangements around 1, 2 and 3 tables are shown below. Tables must be placed only side by side in one row.



(a) In the space below, draw a seating arrangement for a row of 4 tables. [1]

(b) Complete the following table for the seating arrangements.

(c)

[2]

Number of tables	1	2	3	4	5
Number of seats	6	10			

Complete the following formula which connects the number of seats and the number of

. ,	tables.	[2]
	Number of seats =	
(d)	How many seats are there around a row of 7 tables?	[1]
(e)	How many tables are needed for 82 seats?	[2]



Marking Scheme

1.

8. (a)	8a 3a 5a 2a a 4a	B1 B1	For the 5a For the 4a FT 'their 5a' - a
(b)	$ \begin{array}{c cccc} \hline & 11x+y \\ \hline & 9x & 2x+y \\ \hline & 5x & 4x & -2x+y \\ \hline \end{array} $	B1 B1 B1	For the $4x$ For the $2x + y$ FT 'their $4x' - 2x + y$ For the $11x + y$ FT $9x +$ 'their $2x + y$ ', must be in the form $ax + by$

2.

9. (a) $4x + 3y$	B2	Must be an expression, as shown. Award B1 for either of the 2 terms correct within an expression or both terms correct but not in an expression.
(b) (4 x 3) – 5 =7	M1 A1 4	CAO

3.

2015 November Paper 2 (Calculator allowed) Foundation Tier		Marks	FINAL MARK SCHEME Comments
8. (a) 2a – b		B2	Mark final answer. Must be an expression.
			B1 for either term, 2a or -b OR 2a + (-b)
(b) 12		<u>B2</u>	Final answer must be 12 for the B2.
			B1 for 'Add 7 to get 48' followed by B1 for 'Divide by 4 to get 12'
			Accept embedded answers.
(c) Sight of 380 or 260	Sight of (1 ap + 1 pr weighs) 260 (g) OR Sight of (2 ap + 1 pr weighs) 380 (g)	В1	For either reading from the scales
1 apple weighs <u>380</u> – 260 <u>(= 120(g))</u>	2 ap+ 2 pr weigh 520 (g)	M1	F.T. their reading provided 'their 260' is between 200 and 300 exclusive, <u>AND</u> 'their 380' is between 300 and 400 exclusive
1 pear weighs 260 – 120	1 pear weighs 520 – 380	m1	Follow through 'their values for 380, 260 and 520'
= 140 (g)	= 140 (g)	A1	C.A.O.
			A correct solution is awarded all 4 marks
		8	

5. (a) (i) 39	B1	B0 for 6 <i>n</i> +9
(ii) 44	B1	
5. (b) Divide the previous term by 4	B1	Accept ÷4. Accept × ½. Accept quarterly. Accept 'halve and halve again' B0 for dividing into quarters B0 for n/4
5. (c) (p= $3\times2 + 4\times3 - 6\times-1 =$) $6+12+6$ = 24	M1 A1	Award only when a correct substitution is assured Unsupported 24 gets M1,A1. Any other unsupported answer gets M0,A0. SC1 for seeing 6+12-6 = 12
5. (d) 4x <u>ISW</u>	B1	

2	
v.	

8. (a) 4x – 2y	B2	B1 for either in an expression of the form af(x) ± bg(y) Allow B1 for 4–2y OR 4x–2 etc 4x and –2y separated gets B1 4x+–2y gets B1
8. (b) (i) (y=) 72	B1	Accept embedded answers such as 72/6 = 12
8. (b) (ii) $7x = 28$	B1	Isolate the x term
X = 4	B1	F.T. $ax = b \ (a \ne 1) \ B0 \ for \ 28/7$
		Accept embedded answers such as $7 \times 4 - 8 = 20$
8. (c) 5(n+4) OR (n+4)5 OR 5n+20	B2	B1 for 5 × n+4 OR n+4 × 5. B0 for 5n + 4

2015 June Unit 2 (non calculator) Foundation Tier	✓	Marks	Comments
4.(a) 72		B1	
4.(b) (i) (x =) 20		B1	Accept embedded answers
4.(b) (ii) (y =) 7		B1	Accept embedded answers
4.(c) 3p		B1	
4.(d) -2		B1	

7.

6. (a) x = 7	B1	Accept embedded answers throughout question
$ \begin{cases} 6. (a) x = 7 \\ (b) x = 9 \end{cases} $	B1	
(c) 5x = 35	B1	
x = 7	B1	FT "their 35" ÷ 5. If this leads to a whole number it
		must be correctly evaluated. Mark final answer.
	4	·

8.

2015 November UNIT 3 (calculator allowed)		FINAL MARK SCHEME
Foundation Tier	Mark	Comments
16. $8a - 2a = 34 - 7$	B1	FT until 2 nd error.
6a = 27	B1	
a=4.5 or equivalent	B1	Mark final answer. Accept improper fractions provided they are written in simplest form. Accept embedded answers.
	3	-

8. (a) 49	B1	Accept embedded answers in (a), (b) and (c)(i).
(b) $5y = 55$ y = 11	B1 B1	FT one error
(c) (i) $x = 5$ y = -1	B1 B1	ISW FT 'their x ', i.e. $y = 4$ - 'their x '
(ii) $(2 \times 5) + (3 \times -1)$	B1 B1	FT 'their x ' and 'their y ' for B1, and for B2 provided $y < 0$
	7	

2015 June UNIT 3 (calculatorallowed) Foundation Tier	1	Mark	Comments
7. $a = 10$ b = 5	1	B1 B1	FT 15 – 'their a'
$\begin{vmatrix} b \times b \\ (area =) 25 (cm^2) \end{vmatrix}$	1	M1 A1 4	FT for M1 and A1, 'their b×b' provided at least one B1 awarded.

11.

$14.(a) 30 - x = 44 \div 2$ or $60 - 2x = 44$	B1	FT until 2 nd error
30 - x = 22 or -2x = 44 - 60 or 60 - 44 = 2x or -x = -8	B1	FT equivalent level of difficulty
or $16 = 2x$		
X = 8	B1	
		Accept an embedded answer for B3
		Note:
		Writing $2x = -16$ or $-2x = 16$ leading to $x = -8$ is generally
		from 1 error.
		Sight of $2x = 44 - 60$ is regarded as 1 error
		60-x=44 leading to $x=16$ is awarded B0, B1, B0 (as
		level of difficulty is eased)
14. (b) 8a - 14c	B2	B1 for any TWO correct terms from 12a -6c - 4a - 8c
` '		OR B1 for 8a OR B1 for -14c
14. (c) 2, 3, 4, 5	В3	B1 for the 2, B1 for the 5 AND NO 6 or above, B1 for the 3
		and 4 AND NO incorrect numbers, but allow 6 here.
		$SC1 \text{ for } 5/3 \le n \le 6 \text{ (not } 18/3)$
		SOLIDI DI DI LI O (MOTAGO)

12.

18.(a) $x/2 = 26 - 18$ OR $x + 18 \times 2 = 26 \times 2$ $x = 16$	M1 A1	OR alternative full correct method Mark final answer . Accept embedded answer, e.g. 16/2 + 18 = 26
18. (b) $y^3 + 4y$	B2	B1 for a correct term. Mark final answer for B2.

13.

18. $3x - 6 = x + 2$	B1	For expanding the bracket. FT until 2 nd error.
3x - x = 2 + 6	B1	Accept embedded answers
x = 4	B1	
	3	

14.

10. (a) $a/2 = \frac{1}{2}a$	B4	Award B1 for each correct pair
$a^2 = a \times a$		
a + a = 2a		
3a = a + 2a		
(b) $(a^3 =) a \times a \times a$ or equivalent	В1	
(2(a+3)=) 2a+6 or equivalent	В1	
•	6	

9. (a) 8x	B1	
(b) $-2a + 9b$	B2	Must be in an expression, B1 for sight of either
		-2a or 9b. Mark final answer.
(c) -25	B2	B1 for either -40 or 15
(d) $6xy + 14x$	B2	Must be in an expression, B1 for sight of either
		6xy or 14x
(e) 5a (2b - 5)	B2	B1 for $5a(5)$ or $5a(2b)$ or correct partial
		factorisation
	9	

Г	11		B4	B1 for each correct entry
	Three times a number c	3 <i>c</i>		
	Add 3 to a number c and then multiply this total by 6	6(c + 3)		
	Three times a number c and then add 6	3c + 6		
	Add 3 to a number c and then divide this total by 6	$\frac{c+3}{6}$	4	

17.

7. a = 4	B1	CAO
b = 5	B1	FT 9 – 'their a'
c = 3	B1	FT [13 - 'their a'] ÷ 3
d = 2	B1	FT $14 - \text{`their } a + b + c\text{'}$
	4	

18.

2015 June UNIT 3 (calculatorallowed) Foundation Tier	1	Mark	Comments
10.(a) 2x = 16		B1	FT one error
x = 8		B1	Accept embedded answer
		2	-
$10.(b) 42 = 4 \times 3 + 6C$		B1	Correct substitution
6C = 30		B1	FT until second error.
C = 5		B1	Accept embedded answer
		3	_

19.

3. 14	B2	B1 for sight of 32 or (-) 18
	2	

7. (a) (i) (£) 6m	B1	Ignore £s. Allow 6×m or m×6 or m6
7. (a) (ii) x – 4 (kg)	B1	Ignore kg. Allow $xkg - 4kg$, and $y = x - 4$
7. (b) -2	B2	B1 for -14 B0 if x and/or y still left in their answer, e.g. $-14x + 12y$
7. (c) $5x = 20$ x = 4	B1 B1	Isolating the $5x$ F.T. $ax = b$ ($a \ne 1$) Accept embedded answers, e.g. $5 \times 4 - 3 = 17$
7. (d) $(n-4)/6$ OR $\frac{n-4}{6}$	В2	B1 for $n-4$ OR B1 for a linear expression in n divided by 6 including $n-4 \div 6$, OR $n-4/6$ but not $n-4/6$ $n-4=-4n \div 6$ gets B1 for sight of $n-4$ $-4n \div 6$ gets B1 for linear expression in n divided by 6 Ignore $n=4$ the start and $n=6$ at the end of their work.

2015 November Paper 1 (Non calculator) Foundation Tier	Marks	FINAL MARK SO Comments	
3. (Hours worked =) 8×45 (minutes) OR $8 \times \frac{3}{4}$ (hours) = 360 (minutes) OR = 6 (hours)	M1 A1	Conversion to 'hours' not required at this stage.	Special cases SC1 for (£)305 (from 8×30+65) OR
Charge = $(£)30 \times 6 + (£)65$ = $(£) 245$	M1 A1	F.T. 'their time' but there must be an attempt to convert to hours.	SC1 for (£)700 (from 8×£87.50).

22.

5.	(Cost of trees =) $24 \times (£)5$	✓	M1	
	=(£)120	✓	A1	
	(Time taken =) $24 \times \frac{1}{4}$	✓	M1	$24 \times 15 = 360 \text{ is } M0A0$
				but allow F.T. of 360 for final M1A1.
	= 6(hours)	✓	A1	
	(Total bill =) $6 \times (\pounds)10 + (\pounds)120$	✓ .	M1	F.T. 'their time taken' BUT not 15 or 0.25 or 0.15 or 24.
	= (£)180	✓	A1	F.T 'their cost of trees' BUT not (£)5 or (£)24.

23.

7. (a) $S = 0.6 \times 3.8 \times 32.5$	M1	
= 74.1	A1	
(b) Marks = $100.8 \div (4.2 \times 0.6)$	M1	
= 40	A1	
	4	

24.

10. (a) Plotting at least two correct points	P1	
Correct straight line through points	L1	
(b) Approximately 110 (lbs)	B1	FT their graph, within 1 small square
(c) Clear method shown	M1	Accept use of graph or 200 ÷ 2.2 or other valid method. FT their line
Approximately 91 (kg). Accept answers in range 85 - 95	A1	Award SC1 for unsupported answers in the ranges 80 – 84.9 or 95.1-100 Incorrect answers from a correct method but still
	5	in range award M1 A0

25.

7. (a)	Plotting all three points correctly.	P2	P1 for 2 correct plots. A correct line implies P2.
	Line drawn through their points.	L1	F.T. their three plots. Allow curve or 'dog leg' only if P2 not gained.
(b)	32.	B1	F.T. their line. Allow ± ½ 'small square'.
(c)	18(°C) AND a clear reason given.	В1	Some correct use of their graph required. For an accurate graph (or no graph) 18°C needs to be equated to 64°F to 65°F OR 60°F needs to be equated to 15°C to 16°C. Do not accept 'its higher on the line' unless their line has been clearly marked at 60°F and 18°C.

Ribbon marking for 11(a) and 11(b).		
11. (a) Uniform scale on vertical axis.	B1	
		P0,L0 if no attempt at uniform scaling.
Plotting at least two correct points.	P1	\pm '½ a small square'. The origin may be one of the
		points.
Correct line drawn.	L1	Correct line implies P1L1.
(b) (10 stone =) 140 (lbs)	B1	For sight of 140. It may be implied in further work.
Any correct strategy, e.g. 14 times their value at	M1	Accept 10 times their value at 14lbs, if line drawn
10 lbs.		extends that far.
A correct answer <u>for their line</u> .	A1	F.T. their line, OR B1, M1, A1 for answers between
		63(kg) and 64(kg) inclusive.

14. (a) 7n - 1 (b) -6n + 32	B2	B1 for 7n ±
(b) -6n + 32	B2	B1 for -6n <u>+</u>
	4	_

28.

15. (a)10n - 7 (b) -10n + 60 or equivalent	B2 B2 4	B1 for sight of 10n For B2 mark final answer. B1 for sight of -10n
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8. (a) Correct diagram	B1	
(b) 14, 18, 22	B2	Award B1 for two correct entries
(c) Number of seats =	B2	Accept n for number of tables
Number of tables(t) \times 4 +2		Award B1 for \times 4 + 2
		Do not accept 'add four'
(d) 30	B1	FT for equivalent level of difficulty
(e) $(82-2)/4$	M1	FT for equivalent level of difficulty
		Or equivalent method
=20	A1	
	8	

