

**Foundation GCSE Mathematics Revision Pack****ALGEBRA – NON-CALC****Q1.** (a) Simplify  $m + m + m$ ......  
(1)(b) Simplify  $y \times y$ ......  
(1)(c) Simplify fully  $3a - 4b + 2a + 5b$ ......  
(2)**(Total 4 marks)****Q2.** Here are the first 5 terms of a number sequence.

2      5      8      11      14

(a) (i) Write down the next term in the sequence.

.....

(ii) Explain how you got your answer.

.....

.....

(2)

(b) Work out the 8th term in the sequence.

(1)

**(Total 3 marks)****Q3.** (a) Simplify  $2k - k$ .....  
(1)(b) Simplify  $3 \times 4y$ .....  
(1)(c) Simplify  $a + a + a + b + b$ .....  
(2)**(Total 4 marks)**

- Q4.** You can use this rule to work out the number of minutes it takes to cook a chicken.

Multiply the chicken's weight, in kg, by 45. Then add 30.

A chicken's weight is 2 kg.

Use the rule to work out the number of minutes it will take to cook this chicken.

..... minutes

**(Total 2 marks)**

- 
- Q5.** Simplify

$$x + x + x + x + x$$

.....

**(Total 1 mark)**

- 
- Q6.**  $P = 3n$

$$n = 6$$

- (a) Work out the value of  $P$ .

$$P = \dots\dots\dots$$

**(1)**

$$Q = 2c + d$$

$$c = 3$$

$$d = 2$$

- (b) Work out the value of  $Q$ .

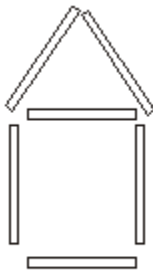
$$Q = \dots\dots\dots$$

**(2)**

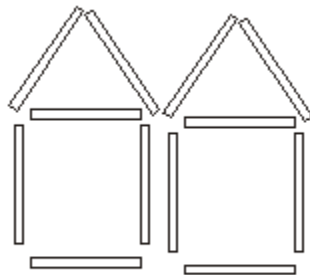
**(Total 3 marks)**

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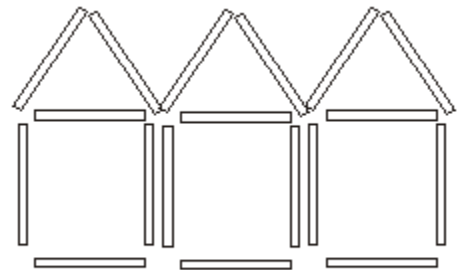
**Q7.** Here are some patterns made from sticks.



Pattern number 1



Pattern number 2



Pattern number 3

(a) Draw Pattern number 4 in the space below.

(1)

(b) How many sticks are used for Pattern number 10?

.....

(2)

Jim says there is a pattern with 123 sticks in it.

(c) Is Jim correct? You must explain your answer.

.....

.....

(2)

(Total 5 marks)

**Q8.** (a) Simplify  $7x + 3x - 4x$

.....

(1)

(b) Solve  $3y - 2 \geq -8$

.....

(2)

(Total 3 marks)

**Q9.** (a) Factorise  $5x - 10y$

.....

(1)

(b) Factorise fully  $3pq - 12p^2$

.....

(2)

(Total 3 marks)

**Q10.** Here are the first 4 terms in a number sequence.

124    122    120    118    ....

(a) Write down the next term in this number sequence.

.....

(1)

(b) Write down the 7th term in this number sequence.

.....

(1)

9 cannot be a term in this number sequence.

(c) Explain why.

.....

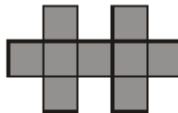
(1)

(Total 3 marks)

**Q11.** Here are some patterns made from squares.



Pattern number 1

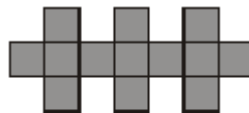


Pattern number 2



Pattern number 3

(a) The diagram below shows part of Pattern number 4  
Complete the diagram for Pattern number 4



Pattern number 4

(1)

(b) Complete the table.

Pattern number	1	2	3	4	5
Number of squares	5	9	13		

(1)

(c) Find the number of squares used for Pattern number 10

.....

(1)

(Total 3 marks)

**Q12.** Ben is  $n$  years old.

Colin is three years younger than Ben.

- (a) Write down an expression, in terms of  $n$ , for Colin's age.

.....

(1)

Daniel is twice as old as Ben.

- (b) Write down an expression, in terms of  $n$ , for Daniel's age.

.....

(1)

(Total 2 marks)

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**Q13.**  $p = 5$

$r = 2$

- (a) Work out the value of  $4p + 3r$

.....

(2)

$n$  is an even number.

- (b) What type of number is  $n + 1$ ?

.....

(1)

(Total 3 marks)

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**Q14**

- (a) Simplify  $y + y + y + y + y$

.....

(1)

- (b) Simplify  $x + 5 + 2x - 7$

.....

(2)

(Total 3 marks)

---

**Q15.** (a) Simplify  $c + c + c$

.....

(1)

(b) Simplify  $4x + 5y - 2x + y$

.....

(2)

(Total 3 marks)

**Q16.** Here are some patterns made from dots.



Pattern number 1



Pattern number 2  
number 3



Pattern

(a) Draw Pattern number 4 in the space below.

(1)

(b) How many dots are needed for Pattern number 15?

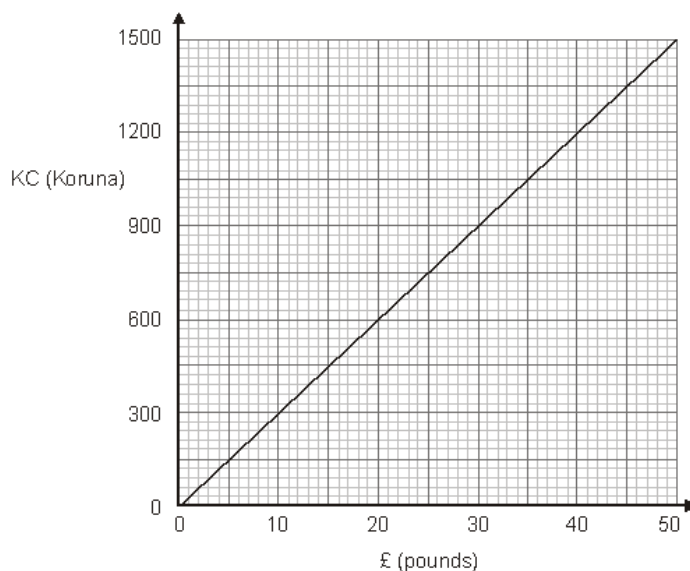
.....

(2)

(Total 3 marks)

**Q17.** Barbara goes on holiday to Prague. The currency in Prague is the Koruna (KC).

This graph can be used to convert between £ (pounds) and KC (Koruna).  
The exchange rate is £1 = 30 KC.



Barbara bought some things in London.  
 She saw the same things on sale in Prague.

The table shows the cost in £ (pounds) and the cost in KC (Koruna).

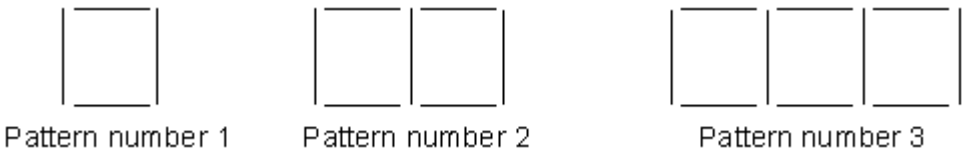
Item	Cost in London £ (pounds)	Cost in Prague KC (Koruna)
Headphones	£15	450 KC
Suitcase	£34	750 KC
Music player	£26	810 KC

Barbara thinks the total cost of these things was more in London than in Prague.

Is she correct?  
 Give a reason for your answer.  
 You must show all your working.

(Total 5 marks)

**Q18.** Here are some patterns made from sticks.



(a) Draw Pattern number 4 in the space below. (1)

(b) How many sticks are needed for Pattern number 12?  
 ..... (2)

Sunil says that he will need 70 sticks for Pattern number 20

(c) Is Sunil correct?  
 You must give a reason for your answer.  
 .....  
 ..... (2)  
 (Total 5 marks)

**Q19.** A bag contains red, yellow and blue balls.

The probability of drawing a red ball at random is  $\frac{1}{2}$ .  
The probability of drawing a yellow ball at random is  $x$ .  
The probability of drawing a blue ball at random is  $4x$ .

Work out the probability that a blue ball is selected.  
Give your answer as a numerical value.

.....

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**(Total 3 marks)**



**M14.**

	Answer	Mark	Additional Guidance
(a)	$3m$	1	<b>B1</b> for $3m$ (accept $m3$ )
(b)	$y^2$	1	<b>B1</b> for $y^2$ cao
(c)	$5a + b$	2	<b>B2</b> for $5a + b$ cao ( <b>B1</b> for $5a$ or $b$ or $1b$ )
Total for Question: 4 marks			

**M15.**

	Answer	Mark	Additional Guidance
(a)(i)	17	2	<b>B1</b> for 17 cao
(ii)	add 3 (each time)		<b>B1</b> for add 3 oe
(b)	23	1	<b>B1</b> for 23 cao
Total for Question: 3 marks			

**M16.**

	Working	Answer	Mark	Additional Guidance
(a)		$k$	1	<b>B1</b> for $k$
(b)		$12y$	1	<b>B1</b> for $12y$
(c)	$(a + a + a) + (b + b)$	$3a + 2b$	2	<b>B2</b> for $3a + 2b$ ( <b>B1</b> for $3a + kb$ or for $ka + 2b$ )

<b>Total for Question: 4 marks</b>
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**M17.**

Working	Answer	Mark	Additional Guidance
$2 \times 45 + 30$	120 minutes	2	<b>M1</b> for $2 \times 45 + 30$ <b>A1</b> for 120 minutes or 2 hours
<b>Total for Question: 2 marks</b>			

**M18.**

Answer	Mark	Additional Guidance
$5x$	1	<b>B1</b> Accept $x5$ or $5 \times x$ or $x \times 5$ or $5..x$
<b>Total for Question: 1 mark</b>		

**M19.**

	Working	Answer	Mark	Additional Guidance
(a)	$3 \times 6$	18	1	<b>B1</b> for 18 cao
(b)	$2 \times 3 + 2$	8	2	<b>M1</b> for $2 \times 3 + 2$ <b>A1</b> for 8 cao
<b>Total for Question: 3 marks</b>				

**M1.**

	Working	Answer	Mark	Additional Guidance
(a)		Correct diagram	1	<b>B1</b> 4 identical shapes to the previous patterns
(b)		60	2	<b>M1</b> continues pattern 6, 12, 18, as far as the 10th A1 cao <b>OR</b> <b>M1</b> indicates that the number of sticks is 6 times the pattern number A1 cao <b>OR</b> <b>M1</b> doubles 30 sticks for pattern number 5 A1 cao
(c)	$123 \div 6$ leaves a remainder of 3, so 'no'	No + justification	2	<b>M1</b> Attempts to divide 120 by 6 <b>A1</b> 'No' + comment on remainder <b>OR</b> <b>M1</b> Starts at 6 and builds up to 120 and 126 A1 'No' + sight of 120 and 126
Total for Question: 5 marks				

**M2.**

	Working	Answer	Mark	Additional Guidance
(a)		$6x$	1	<b>B1</b> cao
(b)		$y \geq -2$	2	<b>M1</b> attempt to isolate $y$ <b>A1</b> cao
Total for Question: 3 marks				

**M4.**

	Working	Answer	Mark	Additional Guidance
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(a)		$5(x - 2y)$	1	<b>B1</b> cao
(b)		$3p(q - 4p)$	2	<b>B2</b> $3p(q - 4p)$ (B1 correct partial factorisation, for example, $p(3q - 12p)$ , $12p(1/4 q - p)$ , $p(aq + bp)$ where $a$ and $b$ are numbers)
<b>Total for Question: 3 marks</b>				

**M5.**

	Answer	Mark	Additional Guidance
(a)	116	1	<b>B1</b> for 116 [accept 114 if 116 seen on the dotted line in the sequence]
(b)	112	1	<b>B1</b> cao
(c)	it is odd (and all the terms are even)	1	<b>B1</b> for a correct reason
<b>Total for Question: 3 marks</b>			

**M6.**

	Answer	Mark	Additional Guidance
(a)	Correct diagram	1	<b>B1</b> for correct diagram, accept squares drawn at either end shaded or unshaded. Ignore internal lines.
(b)	17, 21	1	<b>B1</b> cao
(c)	41	1	<b>B1</b> cao
<b>Total for Question: 3 marks</b>			

**M7.**

	Answer	Mark	Additional Guidance
(a)	$n - 3$	1	<b>B1</b> for $n - 3$ or $1n - 3$ or $-3 + n$ (condone use of N)
(b)	$2n$	1	<b>B1</b> for $2n$ or $n \times 2$ or $2 \times n$ or $n2$ or $n + n$ (condone use of N)
Total for Question: 2 marks			

**M8.**

	Answer	Mark	Additional Guidance
(a)	26	2	<b>M1</b> for $4 \times 5 + 3 \times 2$ <b>A1</b> cao
(b)	Odd	1	<b>B1</b> cao
Total for Question: 3 marks			

**M9.**

	Working	Answer	Mark	Additional Guidance
(a)		$5y$	1	<b>B1</b> for $5y$ or $5 \times y$
(b)	$x + 2x + 5 - 7$	$3x - 2$	2	<b>B2</b> cao [B1 for either $3x$ or $-2$ ]
Total for Question: 3 marks				

**M10.**

	Answer	Mark	Additional Guidance
(a)	$3c$	1	<b>B1</b> cao
(b)	$2x + 6y$	2	<b>B2</b> for $2x + 6y$ ( <b>B1</b> for $2x$ or $6y$ )
Total for Question: 3 marks			

**M11.**

	Working	Answer	Mark	Additional Guidance
(a)		Pattern	1	<b>B1</b>
(b)	7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 46, 49; or $3n + 4$	49	2	<b>M1</b> for method eg counting up in 3s (to at least pattern number 6; allow errors if intention is clear), diagram extension (ft), use of $3n + 4$ (could be shown as part of a valid calculation eg $15 \times 3$ ) <b>A1</b> 49
Total for Question: 3 marks				

**M12.**

Working	Answer	Mark	Additional Guidance
London: £15, £34, £26 (£75) → 450, 1020, 780 (2250) KC Prague: 450, 750, 810 KC (2010KC) → £15, £25, £27 (£67) £ to KC is $\times 30$ ; KC to £ is $\div 30$ .	Yes. Cheaper in Prague (More in London)	5	<b>M1</b> conversion method ( $\times$ or $\div$ as appropriate) or evidence of use of graph (seen, or implied, by at least lines or evidence of conversion by marks on axes) for at least one figure. <b>M1</b> (dep) conversion applied to 3 figures or totals (converted figures must be stated, marks on graph insufficient) <b>A1</b> converted figures shown (all three individual items or totals converted correctly; NB: no tolerance on graph)

			<b>M1</b> totalling converted amounts <b>C1</b> (dep on at least <b>M1</b> ) comparison of “ <b>totals</b> ” and correct conclusion Eg “2250KC” > ”2010KC”, “£75” > ”£67” so cheaper to buy in Prague.
Total for Question: 5 marks			

**M13.**

	Answer	Mark	Additional Guidance
(a)	Pattern drawn	1	<b>B1</b> for correct pattern
(b)	37	2	<b>M1</b> for continuation or diagrams <b>A1</b> cao <b>OR</b> <b>M1</b> for sequence of numbers seen 4, 7, 10, 13, 16 etc <b>A1</b> cao <b>OR</b> <b>M1</b> for use of formula $3n + 1$ with $n = 12$ <b>A1</b> cao
(c)	No	2	<b>M1</b> for attempt to divide 69 by 3 <b>A1</b> for ‘No’ and comment on the fact that this is the number needed for pattern 23 <b>OR</b> <b>M1</b> for Starts at 3 and builds up to 61 <b>A1</b> for ‘No’ and comment on fact that 61 sticks are needed for pattern 20  NB: 0 for an answer that is an incorrect mathematical statement, or an answer that has an incorrect conclusion (eg “yes”)
Total for Question: 5 marks			

**M3.**

Working	Answer	Mark	Additional Guidance
$x + 4x + \frac{1}{2} = 1$	$\frac{4}{10}$	3	<b>M1</b> $x + 4x + \frac{1}{2} = 1$

$5x = \frac{1}{2}, x = \frac{1}{10}$ <b>OR</b> Choose a suitable number of balls ( say 10) 5 will be red The other 5 need to be shared out in the ratio 1:4, hence 1 yellow and 4 blue			$A1 \ x = \frac{1}{10}$ $A1 \ \frac{4}{10} \text{ oe}$
<b>Total for Question: 3 marks</b>			