Name:

Maths Assessment Year 6 Term 3: Algebra

1. Use simple formulae.
2. Generate and describe linear number sequences.
3. Express missing number problems algebraically.
4. Find pairs of numbers that satisfy an equation with two unknowns.
5. Enumerate possibilities of combinations of two variables.

Name: Date:

40 total marks

Maths Assessment Year 6 Term 3: Algebra

1. Use simple formulae.

a) Calculate the value of the letter in each equation:

$3a = 18$	$a =$
$63 = 9b$	$b =$
$5c = 95$	$c =$

3 marks

b) Calculate the value of the letter in each equation:

$4d - 3 = 5$	$d =$
$68 = 5e + 8$	$e =$
$34 - 6f = 10$	$f =$

3 marks

c) In these equations, **x** is worth 7. Calculate the value of **y**.

$y = 2x + 13$	$y =$
$100 - 7x = y$	$y =$
$y = x^2$	$y =$

3 marks

d) The cost of a producing a pack of rubbers is calculated as follows:

Cost = number of rubbers x 11p + 6p for the box.

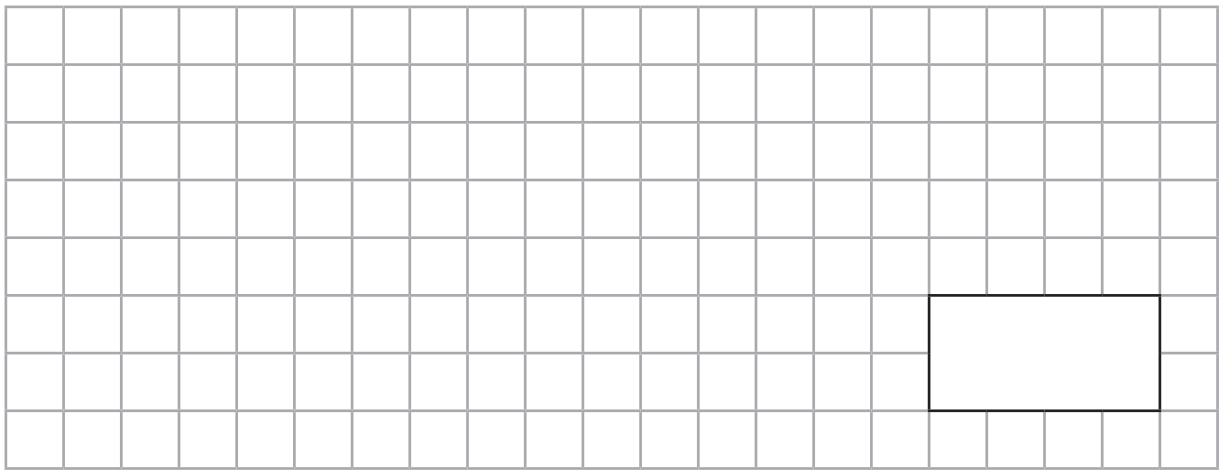
How much will a pack of 12 rubbers cost to produce?

£

1 mark

Total for this page

A pack of rubbers costs £3.36. How many rubbers are in the pack?



2 marks

2. Generate and describe linear number sequences.

a) Fill in the first two terms in this sequence:

		102	111	120

1 mark

b) 9 is the first term in this sequence. What is the tenth term?

9 15 21 27

1 mark

c) Find the missing numbers in this linear sequence:

41			53

1 mark

d) The formula **4n + 9** can be used to calculate the value of the terms in this sequence:

13 17 21 25 29

Complete this table.

term	**calculation**	**value**
1st	4 x 1 + 9	13
5th		
20th		89
100th	4 x 100 + 9	

4 marks

Total for this page

e) The sequence 1, 4, 7, 10 can be expressed as **3n - 2**, where **n** is the term.

i. Express the sequence 1, 6, 11, 16 where **n** is the term.

1 mark

ii. What is the 15th term?

1 mark

iii. Which term is 121?

1 mark

3. Express missing number problems algebraically.

a) A locksmith uses the following charges: £12 callout charge and £15 per hour of work. Circle the formula that could be used to calculate how much the locksmith will charge for each job.

h stands for the number of hours.

12h + 15 | 12h - 15 | 15h + 12 | 15h - 12

1 mark

b) The number **p** is 8 more than the number **q**.

Write 2 algebraic expressions to show the relationship between p and q, using different operations.

2 marks

c) Circle any expression that is an accurate simplification of the expression a + b + a + b:

2a + 2b | 2(b + a) | 2b + 2a | 2(a + b)

1 mark

Total for this page

d) An online shop sells wellington boots for £7, with £6 for delivery. To calculate the cost of each order the shop uses the following formula:

7n + 6

n stands for the number of pairs of wellington boots in each order.

i. Calculate the cost of ordering 8 pairs of wellington boots.

1 mark

ii. A residential outdoor centre places an order costing £251. Calculate how many pairs of wellington boots are ordered.

2 marks

e) A gardener charges £15 per hour for his work, but offers a discount of £5 if paid on the day of work.

Write the formula the gardener would use for calculating what to charge for any work paid on the day.
Use **n** to represent the number of hours worked.

1 mark

Total for this page

4. Find pairs of numbers that satisfy an equation with two unknowns.

a) Find 3 different possible pairs of values for a and b in this equation, where a and b are whole numbers:

ab = 30

Value of a	Value of b

1 mark

b) Find 3 different possible pairs of values for a and b in this equation, where a and b are whole numbers:

ab + 14 = 26

Value of a	Value of b

1 mark

c) Calculate the value of each letter:

$ef = 35$ $\quad e + f = 12$ $\quad e > f$	e = …… f = ……
$g - h = 7$ $\quad g + h = 15$	g = …… h = ……
$2i - j = 12$ $\quad 2j + j = 24$	i = …… j = ……

3 marks

Total for this page

5. Enumerate possibilities of combinations of two variables.

In this equation, **a** and **b** are different whole numbers that are between 20 and 32.

a) Write the calculations that would show all the possible values of a and b.

a + 9 = b

1 mark

b) Use this equation to fill in the missing information in the table below:

2a + 5 = b

Value of a	Value of b
	11
6	
10	
	41

4 marks

Total for this page

Answer Sheet: Maths Assessment Year 6 Term 3: Algebra

<table>
<tr><th>question</th><th>answer</th><th>marks</th><th>notes</th></tr>
<tr><td colspan="4">1. Use simple formulae.</td></tr>
<tr><td>a</td><td>a = 6, b = 7, c = 19</td><td>3</td><td></td></tr>
<tr><td>b</td><td>d = 2, e = 12, f = 4</td><td>3</td><td></td></tr>
<tr><td>c</td><td>y = 27, y = 51, y = 49</td><td>3</td><td></td></tr>
<tr><td>d</td><td>£1.38
30 rubbers</td><td>3</td><td>For the second part, 2 marks for a correct answer, but 1 mark for correct calculations with only 1 error in calculating.</td></tr>
<tr><td colspan="4">2. Generate and describe linear number sequences.</td></tr>
<tr><td>a</td><td>84, 93</td><td>1</td><td></td></tr>
<tr><td>b</td><td>63</td><td>1</td><td></td></tr>
<tr><td>c</td><td>45, 49</td><td>1</td><td></td></tr>
<tr><td>d</td><td><table><tr><th>term</th><th>calculation</th><th>value</th></tr><tr><td>1st</td><td>3 x 1 - 7</td><td>-4</td></tr><tr><td>5th</td><td>4 x 5 + 9</td><td>29</td></tr><tr><td>10th</td><td>4 x 20 + 9</td><td>89</td></tr><tr><td>25th</td><td>4 x 100 + 9</td><td>409</td></tr></table></td><td>4</td><td>Award one mark for each box correctly completed.</td></tr>
<tr><td>e</td><td>5n-4
71
25th term</td><td>3</td><td></td></tr>
<tr><td colspan="4">3. Express missing number problems algebraically.</td></tr>
<tr><td>a</td><td>15h + 12</td><td>1</td><td></td></tr>
<tr><td>b</td><td>p = q + 8 and p - 8 = q</td><td>2</td><td>Allow any expression which is correct (p + 1 = q – 9).</td></tr>
<tr><td>c</td><td>All must be ringed</td><td>1</td><td></td></tr>
<tr><td>di.</td><td>£62</td><td>1</td><td rowspan="2">For the second part, 2 marks for a correct answer, but 1 mark for correct calculations with only 1 error in calculating.</td></tr>
<tr><td>ii.</td><td>35 pairs</td><td>2</td></tr>
<tr><td>e</td><td>15n – 5</td><td>1</td><td></td></tr>
</table>

<table>
<tr><th>question</th><th>answer</th><th>marks</th><th>notes</th></tr>
<tr><td colspan="4">4. Find pairs of numbers that satisfy an equation with two unknowns.</td></tr>
<tr><td>a</td><td>1 x 30, 2 x 15, 5 x 6</td><td>1</td><td>1 mark for all 3 pairs.</td></tr>
<tr><td>b</td><td>1 x 12, 2 x 6, 3 x 4</td><td>1</td><td>1 mark for all 3 pairs.</td></tr>
<tr><td>c</td><td>e = 7, f = 5
g = 11, h = 4
l = 9, j = 6</td><td>3</td><td>1 mark for each correct pair.</td></tr>
<tr><td colspan="4">5. Enumerate possibilities of combinations of two variables.</td></tr>
<tr><td></td><td>21 + 9 = 30
22 + 9 = 31</td><td>1</td><td>1 mark for all 3 correct combinations identified.</td></tr>
<tr><td></td><td><table><tr><td>Value of a</td><td>Value of b</td></tr><tr><td>3</td><td>11</td></tr><tr><td>6</td><td>17</td></tr><tr><td>10</td><td>25</td></tr><tr><td>18</td><td>41</td></tr></table></td><td>4</td><td></td></tr>
<tr><td colspan="2"></td><td>Total
40</td><td></td></tr>
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