Name:

Maths Assessment Year 6: Algebra Term 2

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: Algebra Term 2

1. Use simple formulae.

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

$2a = 18$	$a =$
$45 = 9b$	$b =$
$7c = 56$	$c =$

3 marks

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

$3d - 6 = 9$	$d =$
$81 = 4e + 13$	$e =$
$25 - 7f = 11$	$f =$

3 marks

c) In these equations, **x** is worth 6. Calculate the value of **y**.

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

3 marks

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

Cost = number of pens x 12p + 5p for the box

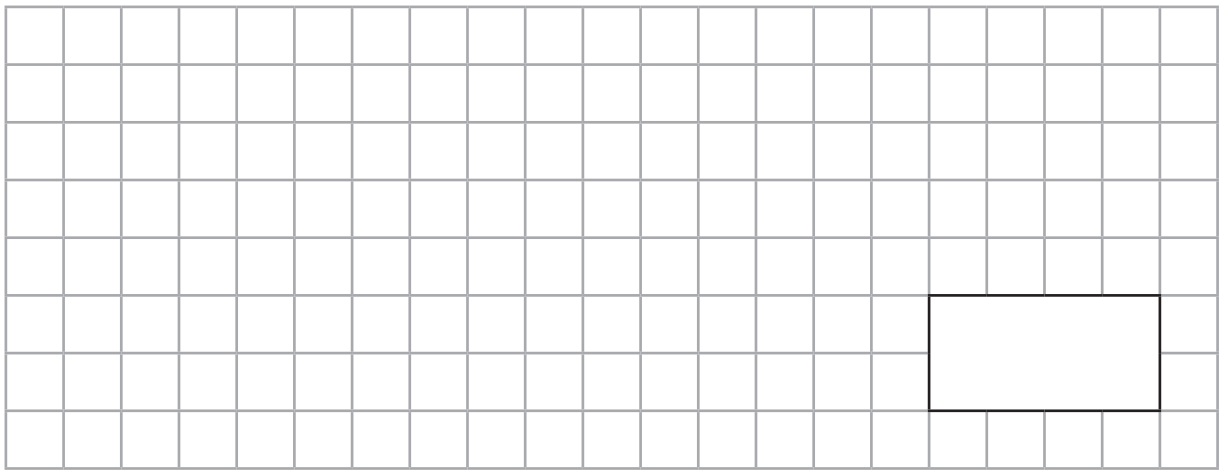
How much will a pack of 6 pens cost to produce?

p

1 mark

Total for this page

A pack of pens costs £2.45. How many pens are in the pack?



2 marks

2. Generate and describe linear number sequences.

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

		108	119	130

1 mark

b) 16 is the first term in this sequence. What is the eighth term?

16 21 26 31

1 mark

c) Find the missing numbers in this linear sequence:

35		53	

1 mark

d) The formula **3n – 7** can be used to calculate the value of the terms in this sequence:

-4 -1 2 5 8

Fill in the missing information in this table:

term	**calculation**	**value**
1st	3 x 1 – 7	-4
5th		
10th		23
20th	3 x 20 - 7	

4 marks

Total for this page

e) The sequence 5, 8, 11, 14 can be expressed as **3n + 2**, where **n** is the term.

i. Express the sequence 7, 11, 15, 19, where **n** is the term.

1 mark

ii. What is the 10^{th} term?

1 mark

iii. Which term is 123?

1 mark

3. Express missing number problems algebraically.

a) A taxi driver uses the following charges: £4 journey charge and £2 per mile. Circle the formula that could be used to calculate how much the taxi driver will charge for each journey.

m stands for the number of miles.

4m + 2 4m - 2 2m + 4 2m - 4

1 mark

b) The letter **p** is 10 less than the letter **q**.

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

2 marks

c) Circle any expression that is not an accurate simplification of the expression a + a + a + b:

3a + b b + 3a 3a = b

1 mark

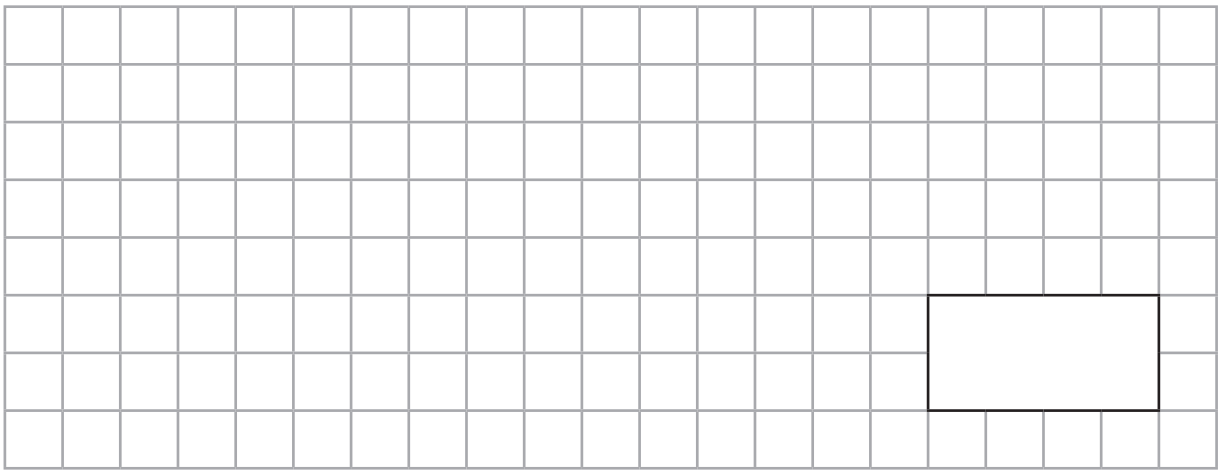
Total for this page

d) An online shop sells football shirts for £8, with £5 for delivery. To calculate the cost of each order the shop uses the following formula:

8n + 5

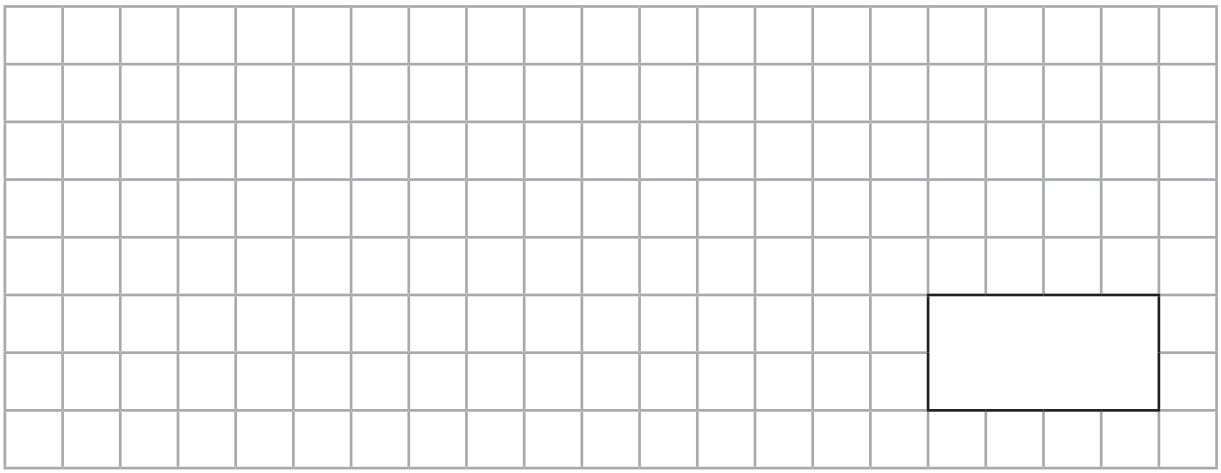
n stands for the number of shirts in each order.

i. Calculate the cost of ordering 12 shirts.



1 mark

ii. A football club places an order costing £365. Calculate how many shirts are ordered.



2 marks

e) A school supplier sells boxes of A4 paper for £4, and offers a £2 discount on any order paid for in advance. Write the formula the supplier would use for calculating what to charge for any order paid in advance.

Use **n** to represent the number of boxes purchased.

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 = 12

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 - 15 = 17

Value of a	Value of b

1 mark

c) Calculate the value of each letter:

$ef = 21$ $\quad e + f = 10$ $\quad e < f$	e = …… f = ……
$g - h = 3$ $\quad g + h = 9$	g = …… h = ……
$i \div j = 4$ $\quad i\,j = 16$	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 10 and 20.

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

a - b = 6

1 mark

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

a + 11 = 3b

Value of a	Value of b
1	
	5
	6
10	

4 marks

Total for this page

Answer Sheet: Maths Assessment Year 6: Algebra term 2

<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 = 9, b = 5, c = 8</td><td>3</td><td></td></tr>
<tr><td>b</td><td>d = 5, e = 17, f = 2</td><td>3</td><td></td></tr>
<tr><td>c</td><td>y = 25, y = 58, y = 36</td><td>3</td><td></td></tr>
<tr><td>d</td><td>77p
20 pens</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>86, 97</td><td>1</td><td></td></tr>
<tr><td>b</td><td>51</td><td>1</td><td></td></tr>
<tr><td>c</td><td>44, 62</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>3 x 5 - 7</td><td>8</td></tr><tr><td>10th</td><td>3 x 10 - 7</td><td>23</td></tr><tr><td>20th</td><td>3 x 20 - 7</td><td>53</td></tr></table></td><td>4</td><td>Award one mark for each box correctly completed.</td></tr>
<tr><td>e</td><td>4n + 3
43
30th 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>2m + 4</td><td>1</td><td></td></tr>
<tr><td>b</td><td>p = q – 10 and p + 10 = q</td><td>2</td><td>Allow any expression which is correct (p + 1 = q – 9)</td></tr>
<tr><td>c</td><td>3a = b</td><td>1</td><td></td></tr>
<tr><td>di.</td><td>£101</td><td>1</td><td></td></tr>
<tr><td>ii.</td><td>45 shirts</td><td>2</td><td>2 marks for a correct answer, but 1 mark for correct calculations with only 1 error in calculating.</td></tr>
<tr><td>e</td><td>4n – 2</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 12, 2 x 6, 3 x 4</td><td>1</td><td>1 mark for all 3 pairs.</td></tr>
<tr><td>b</td><td>1 x 32, 2 x 16, 4 x 8</td><td>1</td><td>1 mark for all 3 pairs.</td></tr>
<tr><td>c</td><td>e = 3, f = 7
g = 6, h = 3
l = 8, j = 2</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>19 – 3 = 6
18 – 12 = 6
17 – 11 = 6</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>1</td><td>4</td></tr><tr><td>4</td><td>5</td></tr><tr><td>7</td><td>6</td></tr><tr><td>10</td><td>7</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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