Maths Assessment Year 6: Algebra

- 1. Use simple formulae.
- a) Calculate the value of the letter in each equation:

3a = 12	a =
30 = 5b	b =
8c = 72	c =
48 = 12d	d =

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

20 = 4h + 4	h =
3i + 5 = 11	i =
14 = 6j -4	j =
2k - 5 = 5	k =

c) In these equations, **a** is worth 7. Calculate the value of each shape:

= 3a	=
4 + a = 🕥	
= 10 - a	=
a + a =	

2. Generate and describe linear number sequences.

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

55 63 71

b) 8 is the **first** term in this sequence. What is the 7th term?

8 11 14 17



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Date:













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c) Find the missing numbers in this sequence:

d) The formula 5n + 1 can be used to calculate the value of the terms in this sequence:

6 11 16 21 26

Fill in the missing information in this table:

term	calculation	value
1st	5 x 1 + 1	6
5th		
10th		51
20th	5 x 20 + 1	

e) 3 7 11 15 19

11 is the **third** term in this sequence. Circle the formula that could be used to calculate this term:

3 x 4 - 1	3 x 5 - 1	3 x 4 + 1

f) 12 22 32 42 52

12 is the **first** term in this sequence. Calculate the 9th term, **showing the formula you would use**:

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3. Express missing number problems algebraically.

 a) A plumber charges £16 for each job that he attends, and then £9 per hour for every hour that he works. Circle the formula that could be used to calculate how much the plumber would charge for a job:

 $\boldsymbol{\mathsf{h}}$ stands for the number of hours worked

9h - 16 16h + 9 9h + 16	
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1 marks

1 mark

4 marks

1 mark

2 marks

b) Emily and Becky are sisters. This formula can be used to calculate Becky's age, compared to Emily's age: e + 4 = b e stands for Emily's age. **b** stands for Becky's age. When Emily is 11, how old will Becky be? When Becky is 17, how old will Emily be? 2 marks c) A gardener calculates the perimeter of a garden to work out how much fencing is needed. She uses this formula: l + w + l + wl stands for the length of the garden. w stands for the width of the garden. **Simplify** this formula: d) A builder needs to calculate the area of a bathroom floor, to work out how much it will cost to tile it. Tiles cost $\pounds 5$ per square metre, plus $\pounds 10$ for delivery. He uses this formula: 5a + 10 **a** stands for area of the floor (in square metres). Calculate the **cost** of tiling a floor, where the area is 10 square metres: Calculate the **area** of a floor, where the cost of tiles is £110: 2 marks e) A painter and decorator charges £8 for every hour that she works, and she is currently offering a discount of $\pounds 5$ on each job. Write the formula she could use to calculate how much money to charge her customers. Use **h** to represent the number of hours. l mark

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:

ab = 18

(**a** and **b** are whole numbers.)

Value of a	Value of b

b) Find 3 different possible pairs of values for **a** and **b** in this equation:

19 = ab + 7

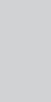
(**a** and **b** are whole numbers.)

Value of a	Value of b

c) Calculate the value of each letter:

ef = 21	e + f = 10	e < f	e =	f =
g – h = 3	g + h = 9		g =	h =
$i \div j = 4$	ij = 16	i > j	i =	j =





3 marks

1 mark



5. Enumerate possibilities of combinations of two variables.

a) In this equation, **a** and **b** are different whole numbers which are both less than 11.

2a = b

Write the calculations that would show all the possible values of ${f a}$ and ${f b}$:

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

Value of a	Value of b
2	
	11
4	

25

7a + 4 = b



1 mark

4 marks



question	answer		notes		
1. Use simple formulae.					
a	3a = 12 $a = 4$ $30 = 5b$ $b = 6$ $8c = 72$ $c = 9$ $48 = 12d$ $d = 4$	4	Award one mark for each answer.		
b			Award one mark for each answer.		
c	$\triangle = 3a$ $\triangle = 21$ $4 + a =$ $\bigcirc = 11$ $\diamondsuit = 10 - a$ $\diamondsuit = 3$ $a + a =$ $\square = 14$	4	Award one mark for each answer.		
2. Generate	e and describe linear number sequences.				
а	39 47 55 63 71	1			
b	26				
с	22 38 54 70	1			
d	Term Calculation Value 1st 5 x 1 + 1 6 5th 5 x 5 + 1 26 10th 5 x 10 + 1 51 20th 5 x 20 + 1 101	4	Award one mark for each box correctly completed.		
e	$(3 \times 4 - 1)$ $3 \times 5 - 1$ $3 \times 4 + 1$				
f 10n + 2 = 92		2	Award two marks for the formula correctly identified. Award one mark for a correct answer, but no formula.		
3. Express missing number problems algebraically.					
а	9h - 16 16h + 9 9h + 16				
b	When Emily is 11, Becky will be 15 When Becky is 17, Emily will be 13	2	Award one mark for each correct answer.		
С	(l+w) x 2 or 2l+2w	1			

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