

Formulae and number sequences

- Use simple formulae
- Generate and describe linear number sequences



Challenge

1 Simplify expressions **a** to **d** and multiply the brackets in expressions **e** to **h**.

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|-----------------------------|------------------------------|
| a $3a + 4a + a$ | b $4x + 3y - y + 2x$ |
| c $5m - 3n + m - 2n$ | d $5s + 5t - 3t + 3s$ |
| e $2(a + b)$ | f $5(2x - y)$ |
| g $3(m + 3n)$ | h $4(2s - 3t)$ |

2 Calculate the next five numbers in these sequences and explain the rule.

- | | |
|---------------------------------|----------------------------------|
| a 6, 10, 14, 18, , , , , | b 80, 72, 64, 56, , , , , |
|---------------------------------|----------------------------------|

Challenge

2

1 Simplify these expressions by grouping like terms and multiplying the brackets.

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|--------------------------------|--------------------------------|---------------------------------|
| a $4(a + 4a + b - 3b)$ | b $2(2x + 3y - y + 4x)$ | c $3(m + 2n + 2m - 4n)$ |
| d $3(2s + 4t - t + 2s)$ | e $5(3m + 4n - 2m - n)$ | f $4(3x - 2y - 2x + 3y)$ |

2 Look at these problems and decide which of the equations gives the correct solution. There may be one or two correct solutions.

- a** Sam had 23 coins in his pocket and used some to buy an ice-cream. He had 11 coins left in his pocket. How many did he use?

$11x = 23$	$11 + x = 23$	$23 + 11 = x$	$23 - x = 11$
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- b** Steve bought a number of pizzas and cut each one into 8 pieces. He had 56 pieces. How many pizzas did he buy?

$p = 56 - 8$	$8p = 56$	$56p = 8$	$p = 56 \times 8$
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- c** The school netball team played 8 matches against other schools and scored 32 goals. What is the equation to show the average number of goals scored?

$g = 8 \div 32$	$g = 32 \div 8$
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$8g = 32$	$32g = 8$
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- d** A rower trains on his rowing machine by rowing 15 km every day except Sunday. How far does he row each week?

$d = 15 \times 7$	$d = 15 + 6$
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$d = 15 \div 6$	$d = 15 \times 6$
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- 3 The n^{th} term in a sequence is $2n - 4$. Calculate the first five terms, the 10th term and the 200th term.

- 4 The n^{th} term in a sequence is $3n + 7$. Calculate the first five terms, the 10th term and the 200th term.



Challenge

3

1 Simplify these expressions by multiplying the brackets and grouping like terms.

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|-----------------------------------|--|
| a $2(3x + y) + 3(2y - x)$ | b $6(3a - 2a) + 8(2b - b)$ |
| c $3(2x - y) + 2(x + 3y)$ | d $4(2a + 2b) + 2(3a - 3b)$ |
| e $4(t + 5s) + 3(2t - 4s)$ | f $5(2a + 2b - a - b) + 4(b - a)$ |



2 Calculate the next five numbers in these sequences. Work out the n^{th} term and calculate a value for the 100th term and the 250th term.

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|-----------------------------|----------------------|------------------------|------------------------|
| a 6, 10, 14, , , , , | n^{th} term | 100 th term | 250 th term |
| b 3, 10, 17, , , , , | n^{th} term | 100 th term | 250 th term |

