Generate sequences from a rule

1 Find the first three terms of these sequences by substituting $n = 1$, $n = 2$ and $n = 3$ into them.

a)

n	1	2	3
$4n$	4	8	12

b)

n	1	2	3
$2n + 3$	5	7	9

c)

n	1	2	3
$7n - 1$	6	13	20

2 Substitute $n = 1$, $n = 2$, $n = 3$, $n = 4$ and $n = 5$ into each of these expressions.

a)

n	1	2	3	4	5
$5n$	5	10	15	20	25

b)

n	1	2	3	4	5
$5n - 5$	0	5	10	15	20

c)

n	1	2	3	4	5
$5n + 2$	7	12	17	22	27

What do you notice about your answers?

What is the same? What is different?

All go up in 5s from a different starting number.

3 Find the first five terms of the sequences given by these rules.

a) $6n - 10$ -4   2   8   14   20

b) $7 + 3n$ 10   13   16   19   22

c) $0.5n - 1$ -0.5   0   0.5   1   1.5
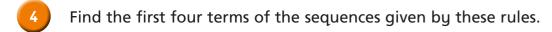
d) $2.3 + 4n$ 6.3   10.3   14.3   18.3   22.3

e) $\dfrac{n + 5}{4}$ 1.5   1.75   2   2.25   2.5

f) $\dfrac{n}{4} + 5$ 5.25   5.5   5.75   6   6.25

How did you work this out? Talk to a partner

4 Find the first four terms of the sequences given by these rules.

a) $20 - 2n$ | 18 | 16 | 14 | 12 |

b) $1 - 4n$ | -3 | -7 | -11 | -15 |

5 Which of these rules do you think will produce ascending sequences?

Which will produce descending sequences? Label the cards.

| $3n - 9$ | $9 - 3n$ | $-9 + 3n$ | $-3n - 9$ |

Ascending   Descending   Ascending   Descending

How did you decide?

When the 'n' term is positive it's
ascending.

Check your answer by substituting several consecutive values of n.

6 Tick the rules that will produce linear sequences.

$\dfrac{n - 7}{2}$ $(n - 7)^2$ $n^2 - 7$ $0.2n - 7$ $2 - 7n$ $\dfrac{n}{2} - 7$
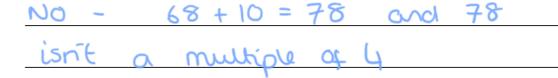
How did you work this out? Talk to a partner.

7 Here is a rule for a sequence.

$$4n - 10$$

a) In which position would the term 2 be? __3rd__

b) What would the 50th term of the sequence be? | 190 |

c) Would the number 77 be in this sequence? Explain how you know.

No - all terms will be even.

d) Would the number 68 be in this sequence? Explain how you know.

No -   68 + 10 = 78   and   78
isn't   a multiple of 4

8 Here is an expression for a sequence.

$$77n - 96$$

a) What is the difference between the 1,000th term and the 990th term?

| 770 |

b) Write two more terms that will have the same difference.
Can you find a rule?

Any terms that are 10 apart.