

Year 7 Maths – Homework Booklet

Week 1 & 2

Algebra - Sequences



Name: _____

Class: _____

Due Date: _____



1) $28 \div 4 =$

13) $96 \div 8 =$

2) $16 \div 4 =$

14) $12 \div 2 =$

3) $11 \times 2 =$

15) $45 \div 5 =$

4) $2 \times 4 =$

16) $33 \div 3 =$

5) $27 \div 9 =$

17) $20 \div 4 =$

6) $99 \div 9 =$

18) $5 \times 10 =$

7) $3 \times 12 =$

19) $24 \div 6 =$

8) $9 \times 9 =$

20) $18 \div 2 =$

9) $36 \div 12 =$

21) $60 \div 5 =$

10) $9 \times 8 =$

22) $9 \times 2 =$

11) $77 \div 7 =$

23) $12 \times 10 =$

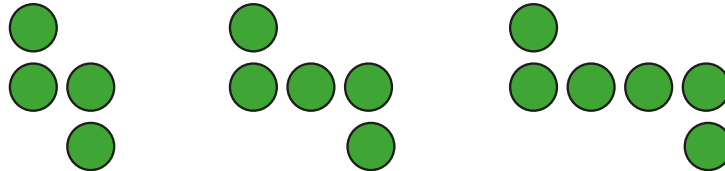
12) $80 \div 8 =$

24) $7 \times 8 =$

Sequences

Name: _____

- 1 Here are the first three terms in a sequence.



- a) Draw the next term in the sequence.

- b) How many circles will there be in the 6th term?

- 2 Find the next two terms in each linear sequence.

a) 11, 16, 21, ,

b) 50, 230, 410, ,

c) 300, 255, 210, ,

1 mark

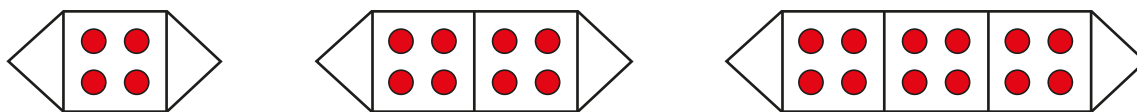
1 mark

1 mark

1 mark

1 mark

- 3 Here are the first three terms in a sequence.



- a) How many dots will there be in the 4th term of the sequence?

1 mark

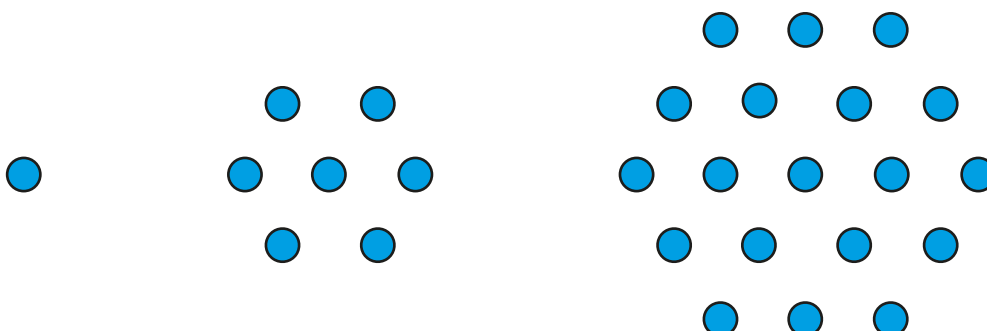
- b) How many triangles will there be in the 19th term of the sequence?

1 mark

- 4 Tick the linear sequences.

1, 5, 25, 125, 625

12.5, 10, 7.5, 5, 2.5



13, 19, 25, 31, 37

2 marks



1) $1 \times 8 =$

13) $24 \div 8 =$

2) $18 \div 3 =$

14) $3 \div 3 =$

3) $12 \times 9 =$

15) $9 \times 6 =$

4) $11 \times 11 =$

16) $3 \times 10 =$

5) $10 \times 5 =$

17) $9 \times 2 =$

6) $54 \div 6 =$

18) $7 \times 7 =$

7) $24 \div 12 =$

19) $77 \div 11 =$

8) $2 \times 12 =$

20) $120 \div 12 =$

9) $24 \div 3 =$

21) $3 \times 12 =$

10) $8 \times 5 =$

22) $7 \times 3 =$

11) $8 \times 12 =$

23) $2 \times 7 =$

12) $30 \div 10 =$

24) $2 \times 10 =$

- 5 Find the next two terms in the geometric sequences.

a) 8, 16, 32, ,

1 mark

b) 45000, 4500, 450, ,

1 mark

- 6 Here is the term-to-term rule of a sequence.

To find the next term, multiply the
previous term by 3

The first term of the sequence is 4

Find the next five terms of the sequence.

2 marks

- 7 Here is the term-to-term rule of a sequence.

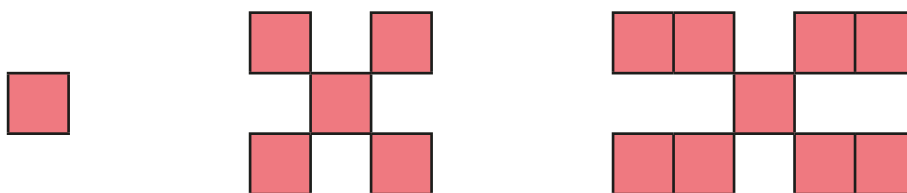
To find the next term, multiply the
previous term by 3 and add 5

The first term of the sequence is 4

Write the next three terms of the sequence.

2 marks

- 8 Here is a sequence.



- a) Complete the table to represent the sequence.

Term	1	2	3	4
Number of squares				

- b) Would the points of the graph of this sequence lie on a straight line?

Explain your answer.

- 9 Find the next two terms in the sequence.

4, 8, 13, 19, ,

- 10 The 1st term of a linear sequence is 15
The 5th term of the sequence is 31
Work out the 10th term of the sequence.

2 marks

YEAR 7 — ALGEBRAIC THINKING...

Sequences

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Describe and continue both linear and non-linear sequences
- Explain term to term rules for linear sequence
- Find missing terms in a linear sequence

Keywords

Sequence: items or numbers put in a pre-decided order

Term: a single number or variable

Position: the place something is located

Rule: instructions that relate two variables

Linear: the difference between terms increases or decreases by the same value each time

Non-linear: the difference between terms increases or decreases in different amounts

Difference: the gap between two terms

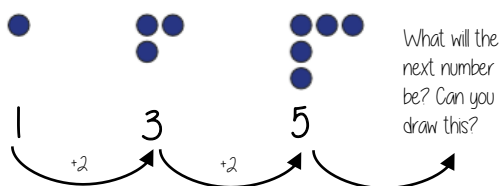
Arithmetic: a sequence where the difference between the terms is constant

Geometric: a sequence where each term is found by multiplying the previous one by a fixed non zero number

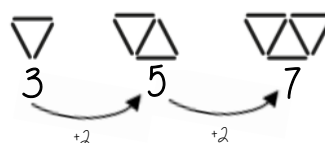


Describe and continue a sequence diagrammatically

Count the number of circles or lines in each image



Predict and check terms



CHECK — draw the next terms



Predictions:

Look at your pattern and consider how it will increase.

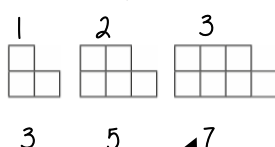
e.g. How many lines in pattern 6?

Prediction - 13

If it is increasing by 2 each time - in 3 more patterns there will be 6 more lines

Sequence in a table and graphically

Position: the place in the sequence



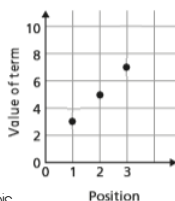
Term: the number or variable (the number of squares in each image)

In a table

Position	1	2	3
Term	3	5	7

Because the terms increase by the same addition each time this is **linear** — as seen in the graph

Graphically



Linear and Non Linear Sequences

Linear Sequences — increase by addition or subtraction and the same amount each time

Non-linear Sequences — do not increase by a constant amount — quadratic, geometric and Fibonacci

- Do not plot as straight lines when modelled graphically
- The differences between terms can be found by addition, subtraction, multiplication or division

Fibonacci Sequence — look out for this type of sequence

0 1 1 2 3 5 8 ...

Each term is the sum of the previous two terms

Continue Linear Sequences

7, 11, 15, 19...

How do I know this is a linear sequence?

It increases by adding 4 to each term

How many terms do I need to make this conclusion?

At least 4 terms — two terms only shows one difference not if this difference is constant (a common difference)

How do I continue the sequence?

You continue to repeat the same difference through the next positions in the sequence

Continue non-linear Sequences

1, 2, 4, 8, 16 ...

How do I know this is a non-linear sequence?

It increases by multiplying the previous term by 2 — this is a geometric sequence because the constant is multiply by 2

How many terms do I need to make this conclusion?

At least 4 terms — two terms only shows one difference not if this difference is constant (a common difference)

How do I continue the sequence?

You continue to repeat the same difference through the next positions in the sequence

Explain term-to-term rule

How you get from term to term

Try to explain this in full sentences not just with mathematical notation

Use key maths language — doubles, halves, multiply by two, add four to the previous term etc

To explain a whole sequence you need to include a term to begin at...

The next term is found by tripling the previous term
The sequence begins at 4

4, 12, 36, 108...

First term