



Year 7 Knowledge Organiser - Sequences and Graphs

Objectives

Generate terms of a sequence from a term-to-term rule

Recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions

Work with coordinates in all four quadrants

Understand and use lines parallel to the axes, $y=x$ and $y=-x$

Key Vocabulary

Sequence – a particular order in which related terms follow each other

Triangular number – terms in which their dots can form equilateral triangles

Square number – a term multiplied by itself

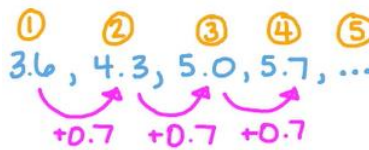
Cube number – a term multiplied by itself twice

Coordinate – locates a position on the x and y axes

Quadrant – one of the four regions of the Cartesian plane bounded by the x-axis and y-axis

Parallel – two lines which are equidistant (never meet)

SQUARE NUMBERS	1	4	9	16	25	36	49	64	81	100
CUBE NUMBERS	1	8	27	64	125	216	343	512	729	1000



Term Number: ① ② ③ ④ ⑤ ...
Arithmetic Sequence: 5, 8, 11, 14, 17, ...
Common difference: +3
• **Sequence**: an ordered list of numbers

• **term of sequence**: each number in a sequence

• **arithmetic sequence**: the difference between any two consecutive terms is always the same

• **common difference**: the difference between any two consecutive terms

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

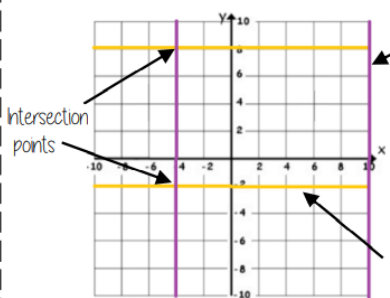
Fibonacci Sequence – look out for this type of sequence

0 1 1 2 3 5 8 ...

Each term is the sum of the previous two terms

The term to term rule is
+3, or...
 $3n + 2$

Lines parallel to the axes



All the points on this line have a x coordinate of 10

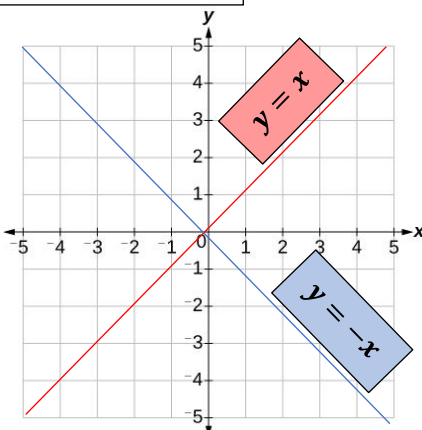
Lines parallel to the y axis take the form $x = a$ and are vertical

Lines parallel to the x axis take the form $y = a$ and are horizontal

All the points on this line have a y coordinate of -2
e.g. (3, -2) (7, -2) (-2, -2)
all lay on this line because the y coordinate is -2

'a' can be ANY positive or negative value including 0

$y = x$ and $y = -x$



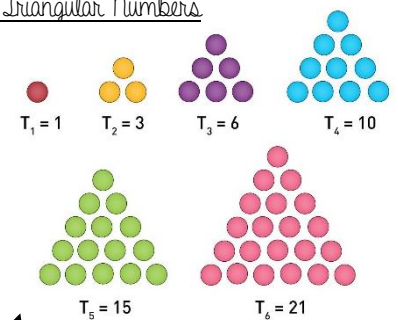
This is a reflection of $y=x$
x and y coordinates change places and are negated.

e.g.
 $x = -2$ and $y = 2 \rightarrow (-2, 2)$

This means x and y have the same value.

e.g.
 $x = 1$ and $y = 1 \rightarrow (1, 1)$
 $x = -4$ and $y = -4 \rightarrow (-4, -4)$

Triangular Numbers



Notice how you add 2, then 3, then 4... to get to the next term in the sequence!

Coordinates in four quadrants

