SUBJECT: Maths
UNIT: Sequences & Nth Term

SANDHILL VIEW
EST. 1953
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Square Numbers	Square Roots
1 x 1 = 1	$\sqrt[2]{1} = 1$
2 x 2 = 4	$\sqrt[2]{4} = 2$
3 x 3 = 9	$\sqrt[2]{9} = 3$
4 x 4 = 16	$\sqrt[2]{16} = 4$
5 x 5 = 25	$\sqrt[2]{25} = 5$
6 x 6 = 36	$\sqrt[2]{36} = 6$
7 x 7 = 49	$\sqrt[2]{49} = 7$
8 x 8 = 64	$\sqrt[2]{64} = 8$
9 x 9 = 81	$\sqrt[2]{81} = 9$
10 x 10 = 100	$\sqrt[2]{100} = 10$
11 x 11 = 121	$\sqrt[2]{121} = 11$
12 x 12 = 144	$\sqrt[2]{144} = 12$

Cube Numbers
1 x 1 x 1 = 1
2 x 2 x 2 = 8
3 x 3 x 3 = 27
4 x 4 x 4 = 64
5 x 5 x 5 = 125

Cube Roots
$\sqrt[3]{1} = 1$
$\sqrt[3]{8} = 2$
$\sqrt[3]{27} = 3$
$\sqrt[3]{64} = 4$
$\sqrt[3]{125} = 5$

Sequences & Nth Term

Sequence:

3, 5, 7, 9, ...

1st term, 2nd term, 3rd term, 4th term

three dots means goes on forever (infinite)

("term", "element" or "member" mean the same thing)

Example
Find the nth term rule:

8, 10, 12, 14
+2 +2 +2

$a = 2$ $2 + b = 8$
$b = 6$

nth term = 2n + 6

Your turn...
Find the nth term rule:

7, 11, 15, 19
+4 +4 +4

$a = 4$ $4 + b = 7$
$b = 3$

nth term = 4n + 3

FIBONACCI SEQUENCE

A series of numbers, starting from 0 where every number is the sum of the two numbers preceding it.

0,1,1,2,3,5,8,13,21,34,55.... and so on

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SUBJECT: Maths

UNIT: Substitution

Key Words

Substitution

Replace

Basic Skills

If a = 2 find 3a

= 3 x 2 = 6

If b = -3 find b + 4

= -3 + 4 = -1

If c = 4 find c - 2

= 4 - 2 = 2

If d = 5 find 10d

= 10 x 5 = 50

If e = 10 find $\frac{20}{e}$

= 20 ÷ 10 = 2

Substitution into Formulae

W = mg

If m = 2 and g = 3 find the value of W

W = 2 x 3 = 6

$P = \frac{F}{A}$

If F = 15 and A = 3 find P.

P = 15 ÷ 3 = 5

P = hpg

If h = 2, p = 3 and g = 10 find P.

P = 2 x 3 x 10 = 60

Speed = distance ÷ time

If distance is 100m and time is 20s find the speed

Speed = 100m ÷ 20s = 5m/s

Substitution into Formulae (with rearranging)

W = mg

If w = 10 and g = 2 find m

10 = m2

10 ÷ 2 = m

5 = m

$P = \frac{F}{A}$

If P = 3 and A = 4 find F

$3 = \frac{F}{4}$

F = 3 x 4 = 12

P = hpg

If P = 24, h = 2 and g = 3, find p

24 = 2 x p x 6

24 = 12 x p

p = 24 ÷ 12 = 2

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SUBJECT: Maths

UNIT: Graphs

Key Words

- gradient
- y-intercept
- parallel
- perpendicular

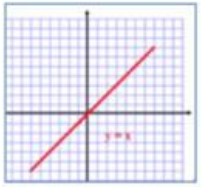
y = mx + c

m = the gradient
c = the y-intercept

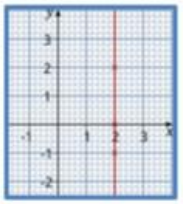
Parallel Lines
Have the same gradient e.g.
y = 2x + 1 and
y = 2x – 4 are parallel

Perpendicular Lines
Are at right angles. Gradients are negative reciprocals e.g. y = 2x + 1 and $y = -\frac{1}{2}x - 4$

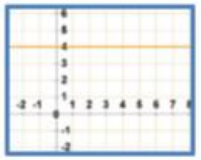
Graphs you need to know



y = x
For this graph all of the y co-ordinates are the same as the x co-ordinates

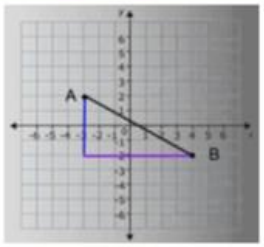


x = graphs cut through the x-axis. This is the graph of x = 2



y = graphs cut through the y-axis. This is the graph of y = 4

Finding the gradient



Rise = -4
Run = 7

Gradient = $-\frac{4}{7}$

Plotting graphs

Plot the graph of y = 2x + 1

x	0	1	2
y	1	3	5

2 x 0 + 1
(0, 1)
See point C

2 x 1 + 1
(1, 3)
See point D

2 x 2 + 1
(2, 5)
See point E