3rd Sep

How many of these sequences can you start...?

1, 4, 9, 16, 25...

square numbers

even numbers

2, 4, 6, 8, 10, 12

1, 3, 5, 7, 9, 11...

odd numbers

5, 10, 15, 20, 25

multiples of 5

1, 4, 7, 10, 13, 16

A sequence going up in 3s Starting with 1

Make a sequence beginning with 2

2, 4, 8, 16, 32, 64 . . . . . .

2, 0, -2, -4, -6, -8, -10 . . . .

2, 7, 4, 9, 6, 11, 8, 13

+5 -3 +5 -3 :

2, 3, 5, 9

x2-1 x2-1

2, 5, 8, 11, 14 . . . . .

2, 3, 5, 8, 12, 17, 23, 30

# Sequences

**A sequence begins:**

**2,4,6,8.....**

**What is the next term?** 10
**What is the 10th term?** 20
**What is the 100th term?** 200
**Which term has a value of 50?** 25
**What is the rule for the sequence?**

| term | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| | 2 | 4 | 6 | 8 | 10 | 12 | 14 |

**Put the sequence in a table like this:**

| | | | | | |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 2 | 4 | 6 | 8 | 10 | 12 |

**Try the same for these sequences:**

1. 3, 6, 9, 12,...
2. 11, 22, 33, 44, ...
3. 5, 6, 7, 8,...
4. -2, -1, 0, 1,...
5. 6, 11, 16, 21,...
6. 5, 8, 11, 14...
7. 9, 19, 29, 39....

What is the next term?
What is the 10th term?
What is the 100th term?
What is the rule for the sequence?

# Continuing Sequences

Write down the next 3 terms of a sequence.Write down the rule.

1. 4,7,10, 13....

2. 0.5, 1.5, 2.5, 3.5....

3. 7, 5, 3, 1.....

# Using Rules

| | 1 | 2 | 3 | 4 | 5 | 6 | |
|---|---|---|---|---|---|---|---|
| . | 4 | 8 | 12 | 16 | 20 | 24 | ×4 |

| term | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Double the term number and add 1 | 3 | 5 | 7 | 9 | 11 | |
| Times the term number by 10 and subtract 2 | 8 | 18 | 28 | 38 | 48 | |
| subtract 5 from the term number | -4 | -3 | -2 | -1 | 0 | |
| double the term number and add 3 | 5, | 7, | 9, | 11, | 13 | |

Write down the first 5 terms of these sequences:

| N | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 2n | 2 | 4 | 6 | 8 | 10 |
| 5n +1 | 6 | 11 | 16 | 21 | 26 |
| 10n -3 | 7, | 17, | 27, | 37, | 47... |
| 3n - 1 | 2, | 5, | 8, | 11, | 14.... |

http://www.interactivestuff.org/sums4fun/sequences.html

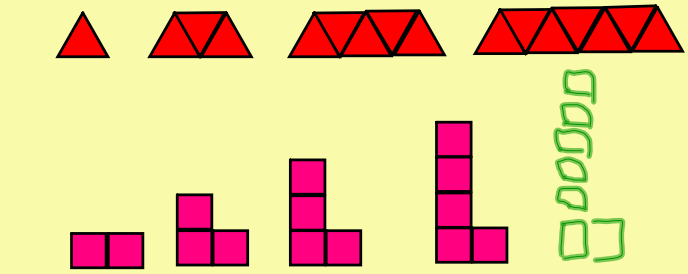
## Write out the first 6 terms of these sequences

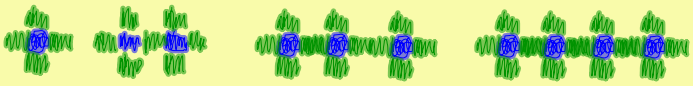
| | 1 | 2 | 3 | 4 | 5 | 10 |
|---|---|---|---|---|---|---|
| 4n+6 | 10 | 14 | 18 | 22 | 26 | 46 |
| 5n - 6 | -1, | 4, | 9, | 14, | 19... | 44 |
| 10 - n | 9, | 8, | 7, | 6, | 5 | 0 |
| 12- 2n | 10, | 8, | 6, | 4, | 2 | -8 |

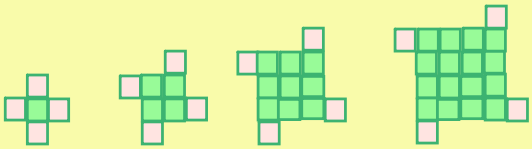
12-20

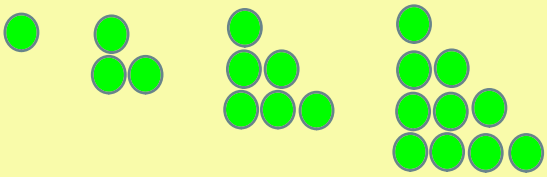
## Picture Sequences

**What will the 6th diagram look like?**

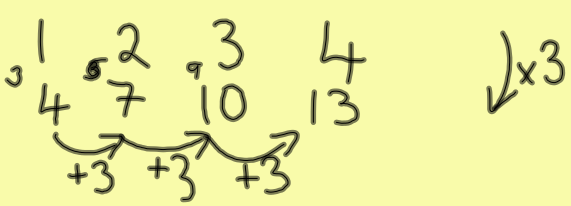


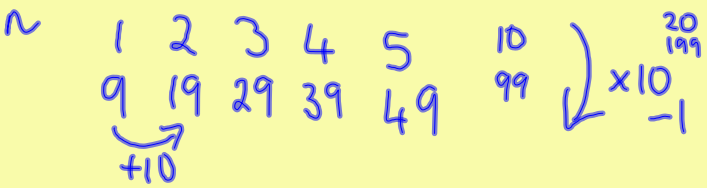




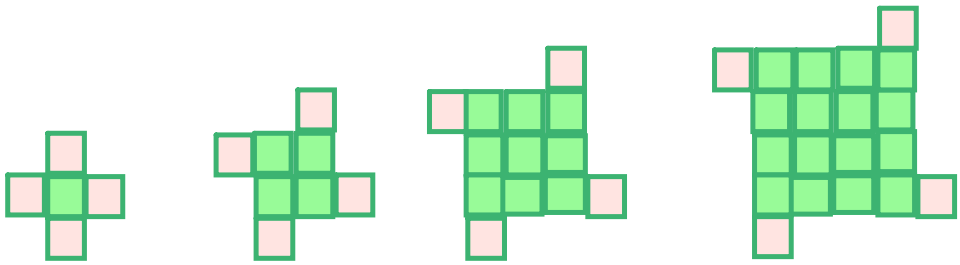


chapter 9



## Windmills



1.Describe the next term

2. What will the tenth term look like?

3. How many tiles will there be on the 20th term?

4. What is the rule for finding the number of tiles?

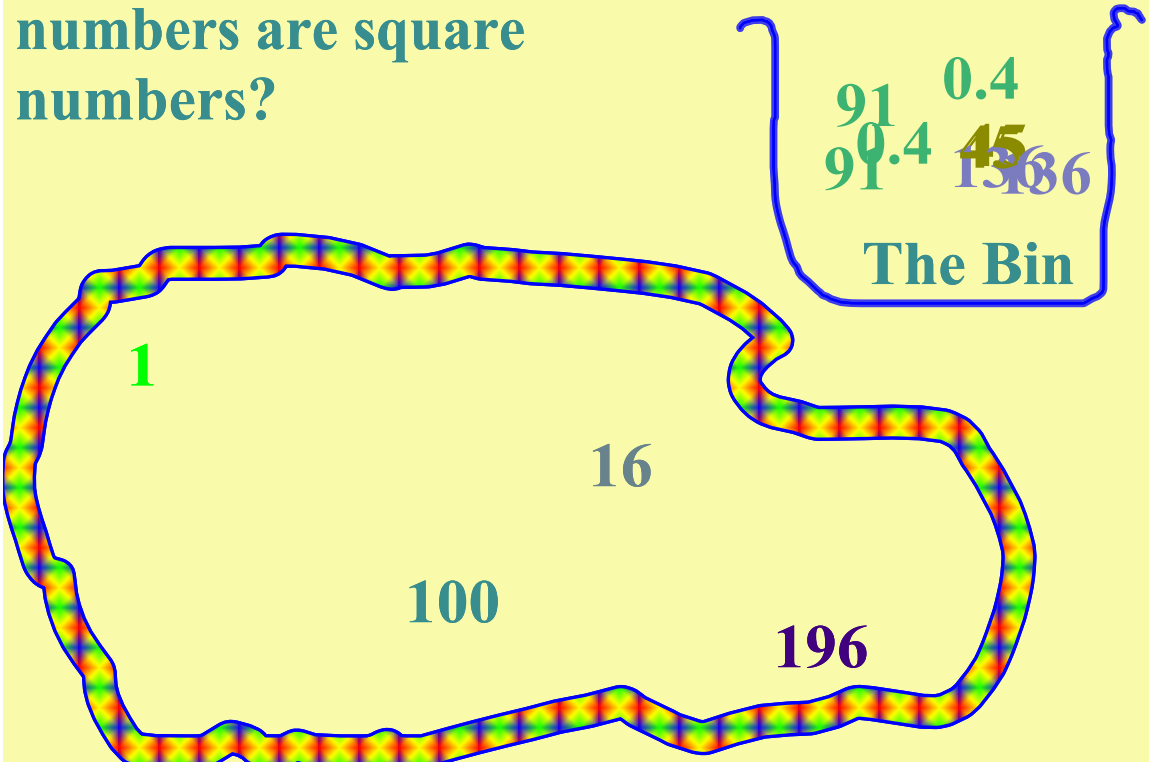
5.Which pattern no will have 148 tiles?

## Sequences

| | |
|---|---|
| G | Continue a sequence of numbers or diagrams |
| G | Write down terms of a simple sequence |
| F | Find a particular term in a sequence involving positive numbers |
| F | Write the term-to-term rule in a sequence involving positive numbers |
| E | Find a particular term in a sequence involving negative or fractional numbers |
| E | Write the term-to-term rule in a sequence involving negative or fractional numbers |
| D | Write the terms of a sequence or a series of diagrams given the *n*th term |
| C | Write the *n*th term of a sequence or a series of diagrams |

## Square numbers

Which of these numbers are square numbers?



## The Square Numbers:

$1^2 = 1 \times 1 = 1$ $5^2 = 25$ $9^2 = 81$

$2^2 = 2 \times 2 = 4$ $6^2 = 36$ $10^2 = 100$

$3^2 = 9$ $7^2 = 49$ $11^2 = 121$

$4^2 = 16$ $8^2 = 64$ $12^2 = 144$

**Find the square numbers up to $20^2$ using your calculator.**

$13^2 = 169$ $16^2 = 256$ $19^2 = 361$

$14^2 = 196$ $17^2 = 289$ $20^2 = 400$

$15^2 = 225$ $18^2 = 324$

tic tac toe

## Square Roots

**The opposite of a square is a square root.**

**For example** $10^2 = 100$

and $\sqrt{100} = 10$

$\sqrt{36} = 6$ $\sqrt{9} = 3$

$\sqrt{121} = 11$ $\sqrt{81} = 9$

$\sqrt{1} = 1$ $\sqrt{196} = 14$

Set your neighbour 5 square roots to find.

**Your calculator has a square root key.**
**Use it to find:**

$\sqrt{400} = 20$ $\sqrt{1849} = 43$

$\sqrt{900} = 30$ $\sqrt{1089} = 33$

game

$\sqrt{40}$

$= 6.3245$

## The Square Numbers:

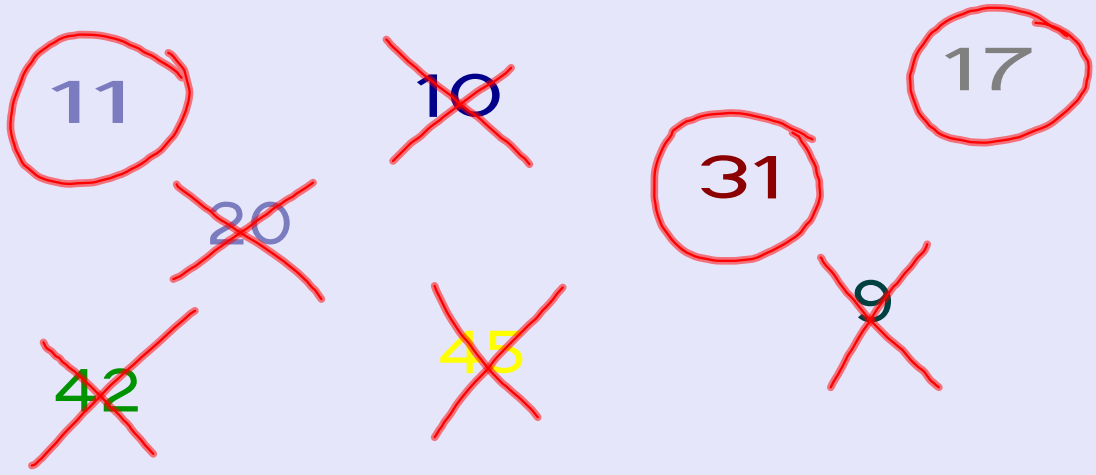
$1^2 = 1 \times 1 = 1$ $5^2 25$ $9^2 81$

$2^2 = 2 \times 2 = 4$ $6^2 36$ $10^2 100$

$3^2 3 \times 3 = 9$ $7^2 49$ $11^2 121$

?

( 1 )

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## Multiples

The multiples of a number are the numbers in that times table.

Eg multiples of 5:

multiples of 11:

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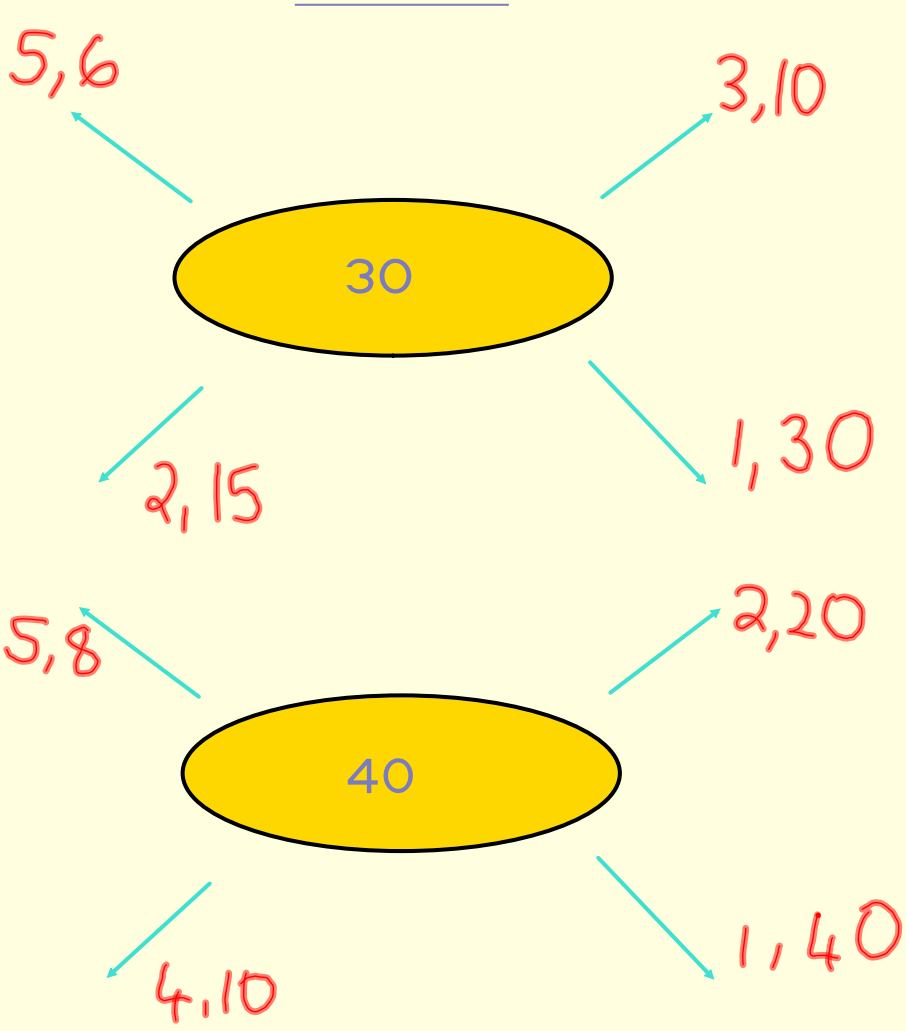


20 : 2,10, 1,20, 4,5

36 : 1,36, 2,18, 3,12, 4,9, 6

100: 1,100, 2,50, 4,25, 5,20, 10

~~1~~48 : 1,48, 2,24, 3,16, 4,12, 6,8

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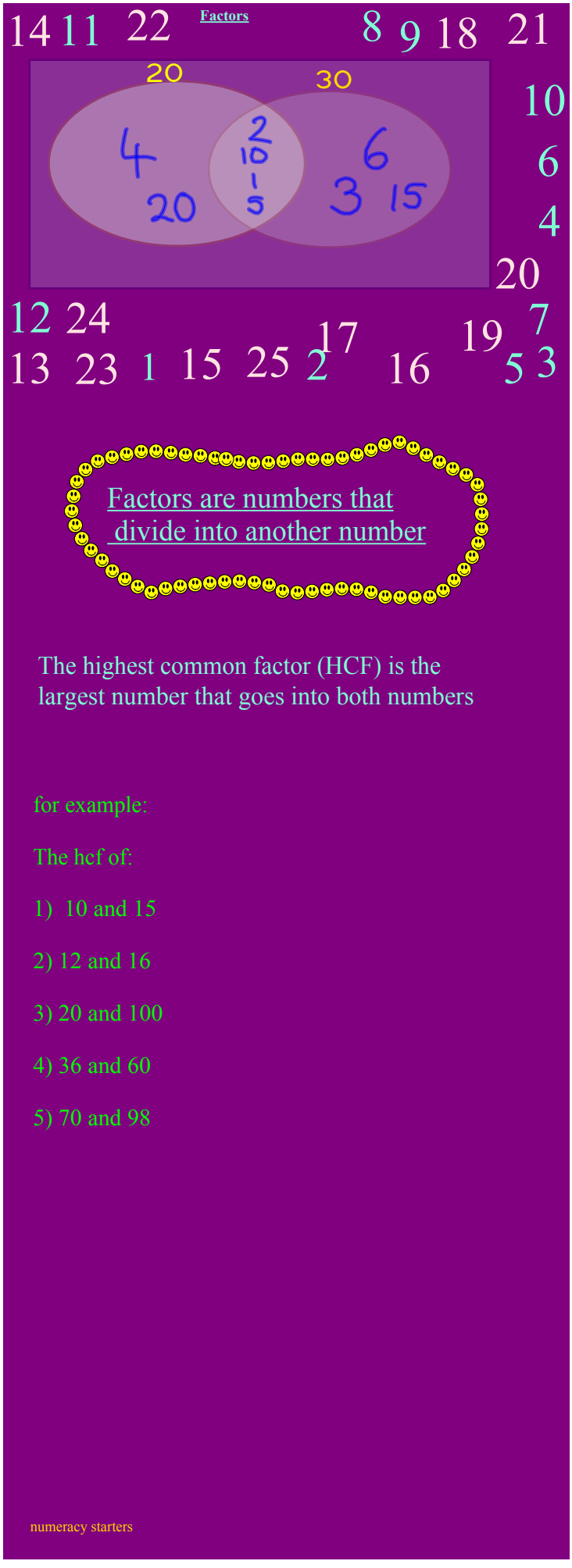
B1-B4


Factors
14 11 22
8 9 18 21
20
30
10
6
4
20
12 24
13 23 1 15 25 2 17 16 19 7 5 3
4
20
2
10
1
5
6
3
15
Factors are numbers that divide into another number
The highest common factor (HCF) is the largest number that goes into both numbers
for example:
The hcf of:
1) 10 and 15
2) 12 and 16
3) 20 and 100
4) 36 and 60
5) 70 and 98
numeracy starters

Complete the factor pairs:

60 3, 20

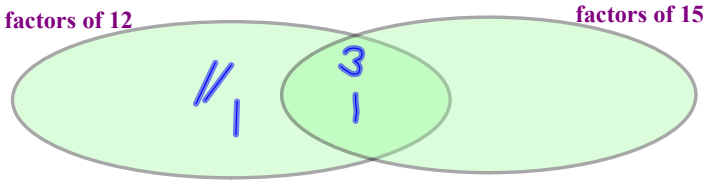
50 2, 25

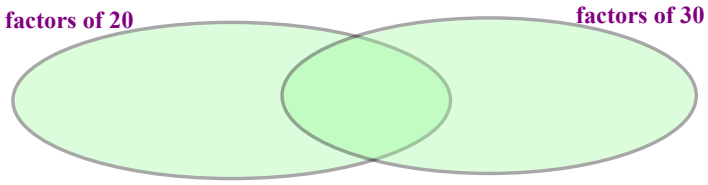
40 4, 10

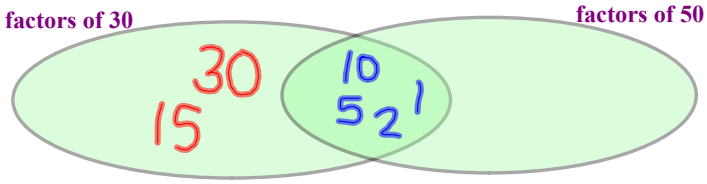
16 4, 4

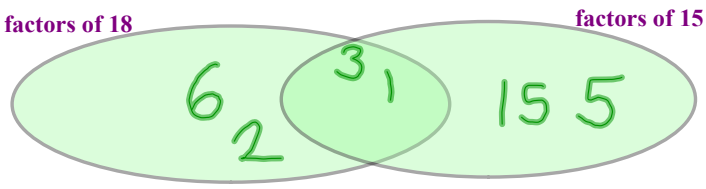
19 1, 19

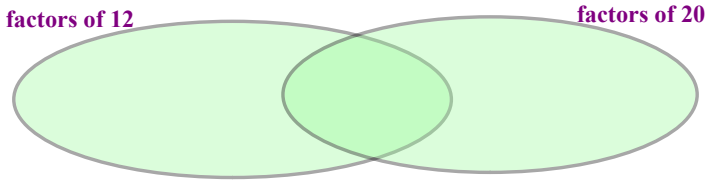
35 7, 5

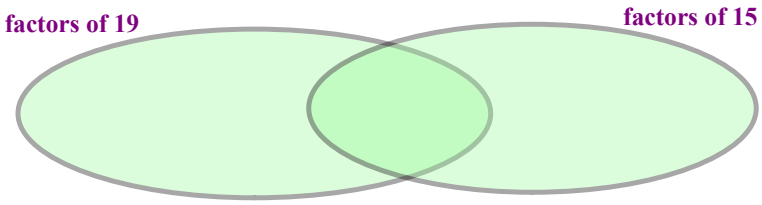


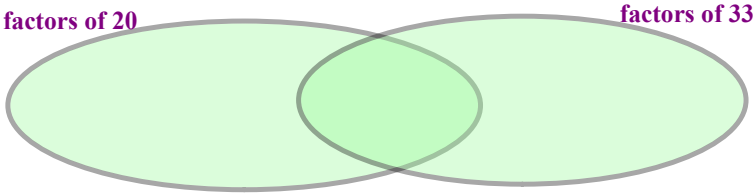



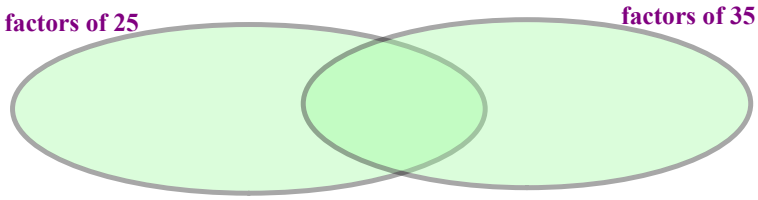



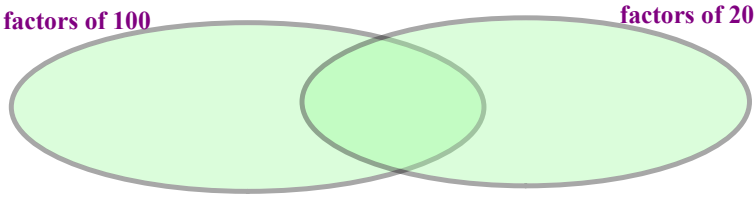



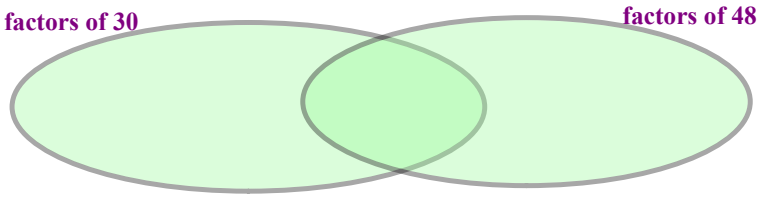




factors of 19
factors of 15


factors of 20
factors of 33


factors of 25
factors of 35

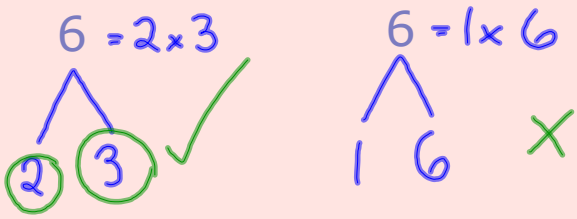

factors of 100
factors of 20

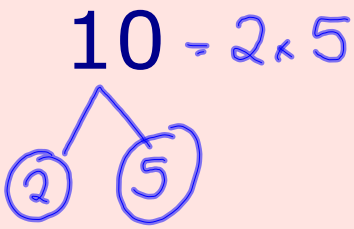

factors of 30
factors of 48

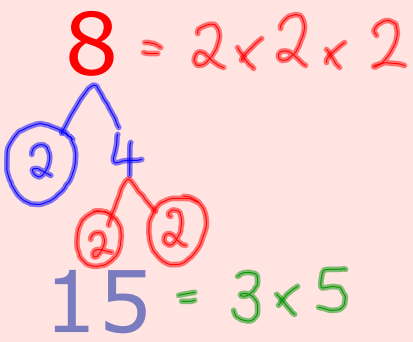
# Products of primes

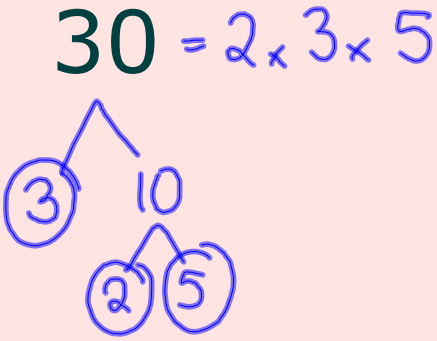
Product means multiply
Some primes are
2, 3, 5, 7, 11

Write the following numbers as a product of their prime factors.



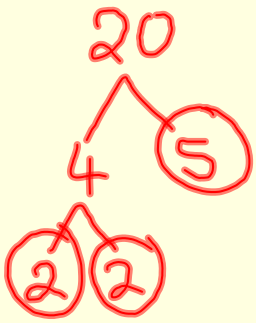



Express the following numbers as a product of their prime factors:

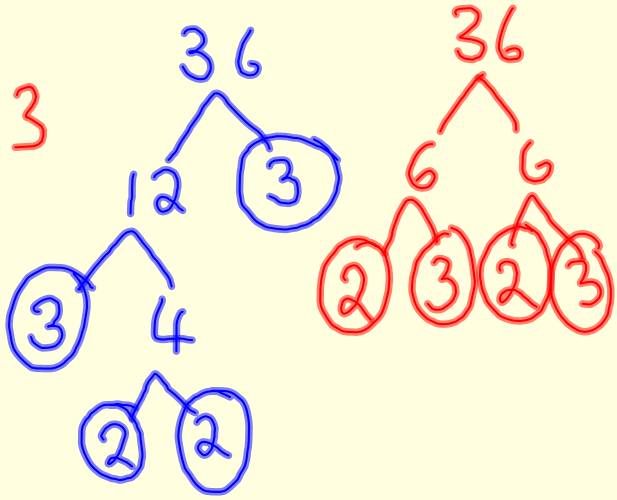
$10 = 2 \times 5$

$20 = 2 \times 2 \times 5$




$25 = 5 \times 5$

$36 = 2 \times 2 \times 3 \times 3$




$100 = 2 \times 2 \times 5 \times 5$

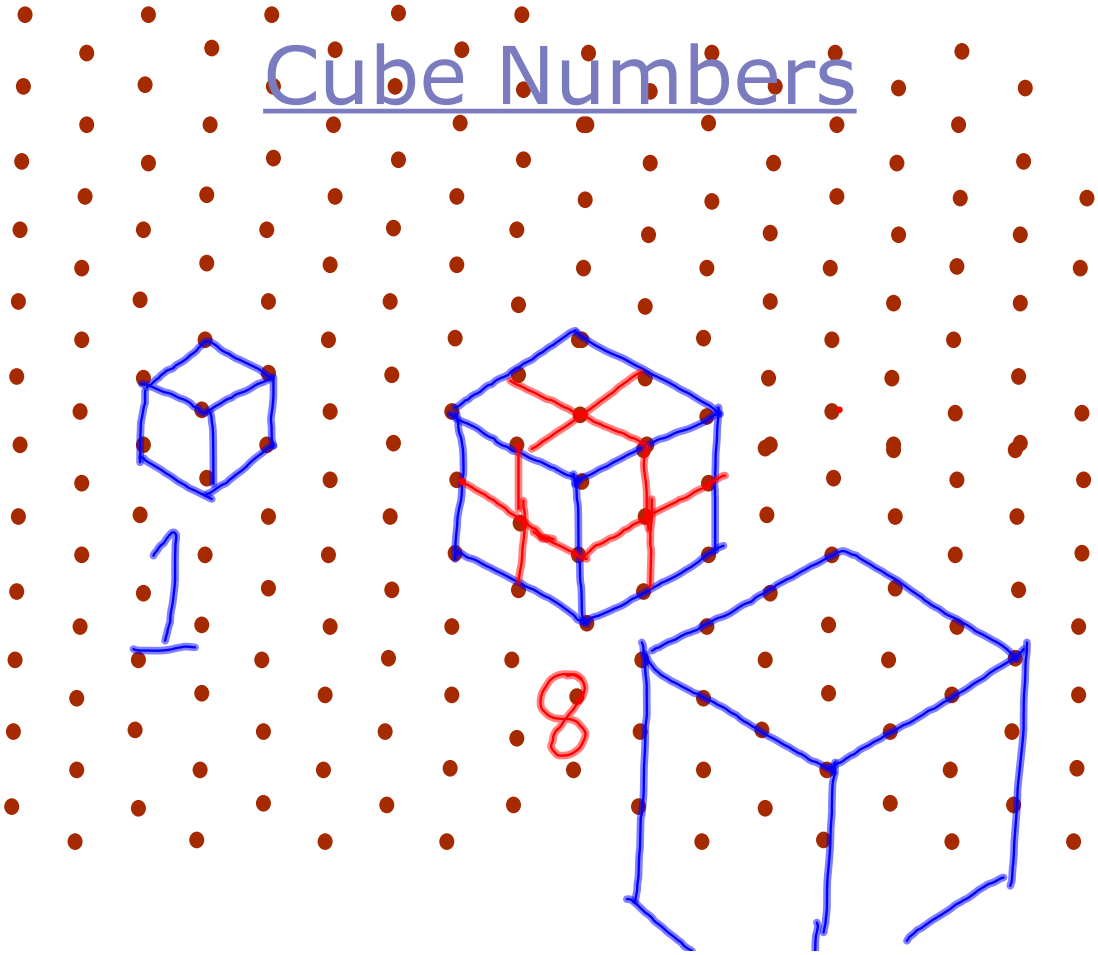
$80 = 2 \times 2 \times 2 \times 2 \times 5$

$64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$48 = 2 \times 2 \times 2 \times 2 \times 3$

$140 = 2 \times 2 \times 5 \times 7$

# Cube Numbers



# Cube Numbers

The cube numbers are:

$1^3 = 1 \times 1 \times 1 = 1$

$2^3 = 2 \times 2 \times 2 = 8$

$3^3 = 3 \times 3 \times 3 = 27$

$4^3 = 4 \times 4 \times 4 = 64$

$5^3 = 5 \times 5 \times 5 = 125$

$10^3 = 10 \times 10 \times 10 = 1000$

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# Sequences

Find the least common multiple (LCM) of two simple numbers (We'll do this later)
Find the highest common factor (HCF) of two simple numbers
Recognise prime numbers
Write a number as a product of prime factors (later)
Find the reciprocal of a number (later)
Learn and recognise common sequences such as Square Numbers,Triangle Numbers, Multiples, etc

## Attachments

families of graphs.xbk

y=mx+c on autograph.doc

STRAIGHT LINE GRAPHS.DOC

alg3upper.doc