Wednesday 1st July

Today we will investigate perfect numbers. 

Before we do that, test yourself with the following questions, thinking about whether you can solve any using a mental method.

There are more challenges waiting for you on Sumdog too!

A. 32 + 47 =	B. 45.32 + 2.23 =
C. 56.47 – 23.85 =	D. 8.73 x 10 =
E. 4,568 ÷ 7 =	

Q1 Finlay is playing a big game of snakes and ladders.

On his board, there are 13 squares in each row and 15 squares in each column.

How many squares are there on the board altogether?

_____ squares

1 mark

Q2 Ava thinks of two prime numbers.

She adds the two numbers together.

Her answer is 24.

Write **all** the possible pairs of prime numbers Ava could be thinking of.

_____

_____

_____

_____

Q3 Put a tick in each row to complete this table.

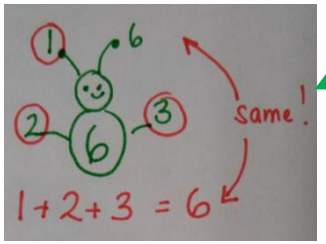
One has been done for you.

	Less than 0.75	Greater than 0.75
0.61	✓	
$\frac{4}{5}$		
$\frac{23}{28}$		
$\frac{1}{2}$		
0.078		

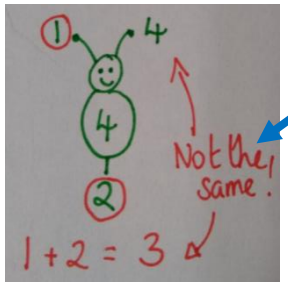
2 marks

Can You Find a Perfect Number?

People have been searching for number patterns since ancient times.
Mathematicians noticed that some numbers are equal to the sum of all of their **factors** (but not including the number itself).

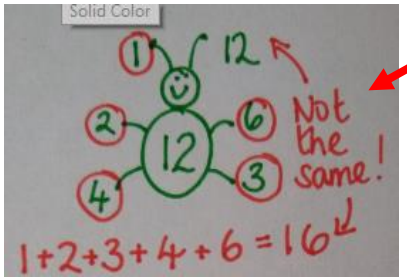


6 is a number that equals the sum of its factors: 1 + 2 + 3 equal 6.
Numbers like 6 that equal the sum of their factors are called **perfect** numbers.
6 is the first **perfect number**.



4 is not a **perfect number** because the sum of its factors (besides 4 itself), 1+2, is less than 4.

Numbers like 4 are known as **deficient numbers**, because the sum of the factors is **less than** the number itself.



12 is not a **perfect number** because the sum of its factors, 1+2+3+4+6 is greater than 12. Numbers like 12 are known as **abundant numbers** because the sum of the factors is **more than** the number itself.

Since the time of Pythagoras (about 500 BC), mathematicians have tried to find as many perfect numbers as they can. By 1999 only 38 perfect numbers had been found.

- Can you find the next perfect number after 6?
  Are the numbers that come before it deficient numbers or abundant?

Answers

A. 32 + 47 = 79 *(M)*

B. 45.32 + 2.23 = 47.55 *(M)*

C. 56.47 – 23.85 = 32.62 *(W)*

D. 8.73 x 10 = 87.3 *(M)*

E. 4,568 ÷ 7 = 652 r 4 or 652 $\frac{4}{7}$ *(W)*

Q1 Finlay is playing a big game of snakes and ladders.

On his board, there are 13 squares in each row and 15 squares in each column.

How many squares are there on the board altogether?

195 squares

1 mark

Q2 Ava thinks of two prime numbers.

She adds the two numbers together.

Her answer is 24.

Write **all** the possible pairs of prime numbers Ava could be thinking of.

17,7

19,5

13,11

Q3 Put a tick in each row to complete this table.

One has been done for you.

	Less than 0.75	Greater than 0.75
0.61	✓	
$\frac{4}{5}$		✓
$\frac{23}{28}$		✓
$\frac{1}{2}$	✓	
0.078	✓	

2 marks

The next perfect number is 28

Of the numbers that come before it (precede it), these are abundant: 12, 18, 20, 24.

All the others are deficient numbers.