

Sums. They're Math Magic

12 – Divisible By Numbers

Please go through each slide stopping until you have understood the concept described

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12 - Divisible By Numbers

Divisible By Three

If the sum of the digits of a number is divisible by three then the number is divisible by three.

e.g. if the number with digits ABC also has $A+B+C$ divisible by three then the number is divisible by three.

Is 345 divisible by 3?

$3+4+5=12$ and, using the digits from 12, $1+2=3$ which is divisible by 3

So 345 and 12 are divisible by 3

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Divisible By Three

Proof

If the number has digits ABC then the number is
 $100A+10B+C$

We can also write the number as $99A+A + 9B+B +C = 99A$
 $+ 9B + A+B+C$

Clearly $99A+9B$ is divisible by 3 and we are told that
 $A+B+C$ is also divisible by 3.

Therefore $100A+10B+C$ must also be divisible by 3.

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Divisible By Nine

If the sum of the digits of a number is divisible by nine then the number is divisible by nine.

It is exactly the same proof.

We again write the number as $99A+A + 9B+B +C$

$99A+9B$ is divisible by 9 and we are told that $A+B+C$ is also divisible by 9.

Therefore $100A+10B+C$ must also be divisible by 9.

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Please go to the next lesson.

Is It A Prime Number?