

Activity thirty

Divisibility tests of 2, 3, 4 and 5

Sometimes we need to tell by quick look at a number whether it is divisible by another number or not. This method helps us to test the divisibility without actually carrying out the division.

1. Test for 2

A number is divisible by 2 if the digit in the ones place is 0, 2, 4, 6 or 8 e.g. 472,3310 etc.

2. Test for 3

A number is divisible by 3 if the sum of its digits is divisible by 3 e.g. 741 = 7+4+1 =12 and 12=1+2=3.

Since 3 is divisible by 3 then 12 is divisible by 3 and 714 is divisible by 3 but 716 is not divisible by 3 because 7+1+6 = 14 and 14 is not divisible by 3.

3. Test for 4

A number is divisible by 4 if the number formed by its last two digits is divisible by 4 e.g. 572. The last two digits are 7 and 2.

The number formed is 72. 72 is divisible by 4

Therefore 572 is divisible by 4.

4. Test for 5

A number is divisible by 5 if the digit in the ones place is either 0 or 5.

Example: 770 or 405

Remember:

- Zero is a multiple of every number e.g. $0 = 0 \times 17$
- Multiples of 2 are known as even numbers.
- Every number is a multiple of itself e.g. $18 = 18 \times 1$
- If p is a divisor of q then q is a multiple of p .

Note:

1. 7 is a divisor of 28 is a multiple of 7.

A product is either a multiple or a factor.

2. 7 x 4 = 28
 factor factor product

28 is a multiple of 4. It is also a multiple of 7.

Divisibility tests for number 6 and 11

A. Test for 6

A number is divisibility by 6 divisible by 2 and 3. In other words a number is divisible by 6 if it is even and the sum of its digits is divisible by 3.

Example: 612 is divisible by 6 since it is even number and the sum of its digits $6 + 1 + 2 = 9$ is divisible by 3.
738 is divisible by 6 since it is an even number and the sum of its digits $7 + 3 + 8 = 18$ is divisible by 3. Therefore 738 divisible by 6.

B. Divisibility test for 7

When the last digit of a number is doubled and the result is subtracted from the number formed by the remaining digits. The outcome is divisible by 7.

Example: Takes the number 861
The last digit is 1 and the number formed by the remaining digits is 86, double 1 to give $(1+1) = 2$
Subtract 2 from 86 to give $(86 - 2) = 84$
84 is divisible by 7. Hence 861 is also divisible by 7.

For big numbers that cannot easily be detected as numbers divisible by 7, repeat the same procedure on the last result obtained after subtracting.\

Example: In the number 1792
We double the last digit 2 to get $(2+2) = 4$
We subtract 4 from 179 to get $(179 - 4) = 175$
We double the last digit 5 to get $(5+5) = 10$
We subtract 10 from 17 to get $(17 - 10) = 7$
7 is divisible by 7
Therefore 1792 is also divisible by 7

C. Test for 8

- A number is divisible by 8 if the number formed by the last three digits is divisible by 8.

Example:

In the number 7960, 960 is the number formed by the last three digits. It is divisible by 8 therefore 7960 is divisible by 8.

5188 Since 188 is not divisible by 8, 5188 is not divisible by 8.

Exercise 1

- List the first 10 multiples of
 - 2.
 - 3.
 - 4.
 - 5.
- Find the missing numbers
 - {0, 2, ?, ?, ?, 12}
 - {0, ?, 6, 9, ?, ?, ?, 21}.
 - {0, ?, ?, ?, ?, ?, ?, ?, 32, 36, ?, 44}.
 - {0, 5, ?, ?, 20, ?, ?, ?, 40}.
- Without dividing, which of the following numbers. {8, 15, 24, 27, 30, 36, 72, 77, 195, 240} are divisible by:
 - 2?
 - 3?
 - 4?
 - 5?
- $K = \{0, 80, 144, 197, 297, 635, 894\}$
Use divisibility tests to find the members in K which are divisible by:
 - 2
 - 3
 - 4
 - 5
- Which of the following numbers are divisible by 5?
 - 192
 - 205
 - 1003
 - 1460
 - 10400
- Which number when divided by 4 leaves remainder 3?
 - 121
 - 166
 - 239
 - 174
- When you add 2 to a number and divide the result by 3, the result will be 56. Which of these is the number.
 - 121
 - 166
 - 239
 - 174

Cdcjkbcjd cvbcv vb vrfbv jvjk vf ujbvr vk ui cvdfjvfjk ujb jvbj cvu jbuvcv ujj cbc cvc cvvbvb