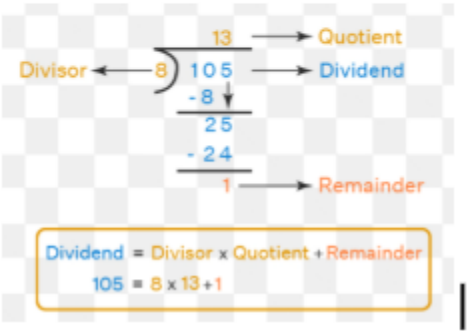
A number is divisible by another number if it can be divided evenly by that number, with no remainder left over.

Learning:-
Dividend = Divisor x Quotient + Remainder
Above equation is also called Division Algorithm/Formula



When Remainder = 0, we say Dividend is Divisible by Divisor.

Question:- Agar aapko Divisor diya ho, toh Dividend kaisa ho ki Divisior se divide karne par Remainder 0 aaye?

Ans:- Use kehte hai Divisibility of Divisor

Divisibility by Number	Divisibility Rule
Divisibility by 2	The last digit should be even.
Divisibility by 3	The sum of the digits should be divisible by 3.
Divisibility by 4	The last two digits should be divisible by 4.
Divisibility by 5	The last digit should either be 0 or 5.
Divisibility by 6	The number should be divisible by both 2 and 3.
Divisibility by 7	The double of the last digit, when subtracted by the rest of the number, the difference obtained should be divisible by 7.
Divisibility by 8	The last three digits should be divisible by 8.
Divisibility by 9	The sum of the digits should be divisible by 9.

Divisibility Rule of 2

A number is divisible by 2 if the last digit of the number is any of the following digits 0, 2, 4, 6, 8. The numbers with the last digits 0, 2, 4, 6, and 8 are called even numbers.

Example: *2580, 4564, 90032 etc. are divisible by 2.*

Divisibility Rule of 3

A number is divisible by 3 if the sum of its digits is divisible by 3.

Example: *90453 (9 + 0 + 4 +5 + 3 = 21) 21 is divisible by 3. 21 = 3 × 7. Therefore, 90453 is also divisible by 3.*

Divisibility Rule of 4

A number is divisible by 4 if the last two digits are divisible by 4.

> ***Example:*** *456832960, here the last two digits are 60 that are divisible by 4 i.e.15 × 4 = 60. Therefore, the total number is divisible by 4.*

Divisibility Rule of 5

A number is divisible by five if the last digit of that number is either 0 or 5.

> ***Example:*** *500985, 3456780, 9005643210, 12345678905 etc.*

Divisibility Rule of 6

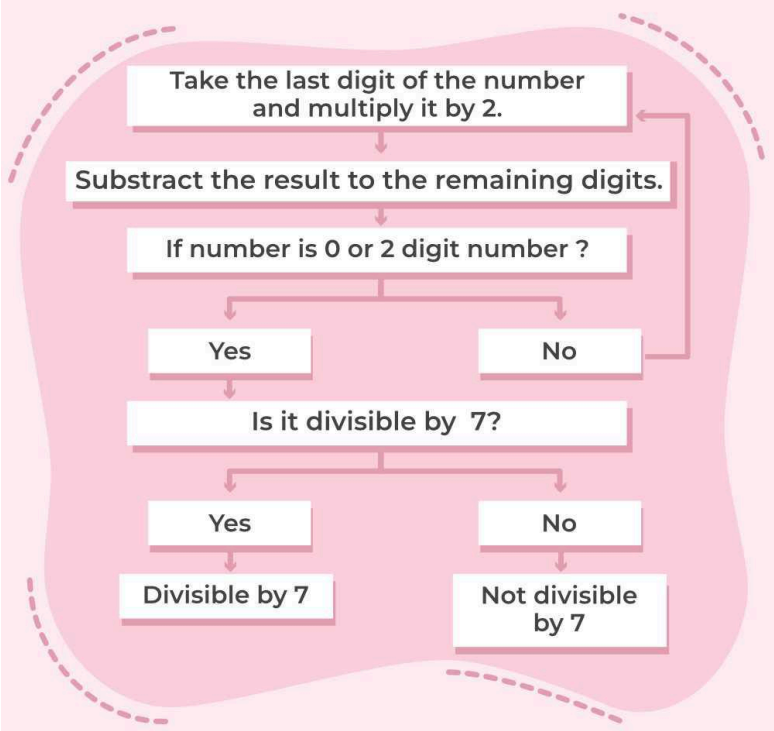
A number is divisible by 6 if it is divisible by both 2 and 3.

> ***Example:*** *10008, have 8 at one's place so is divisible by 2 and the sum of 1, 0, 0, 0 and 8 gives the total 9 which is divisible by 3. Therefore, 10008 is divisible by 6.*

Divisibility Rule of 7

Following are the steps to check the divisibility rule for 7,

1. Take the last digit and then double the last digit.
2. Subtract the result from the remaining number.
3. If the number is 0 or a multiple of 7, then the original number is divisible by 7. Else, it is not divisible by 7.



***Example**: Consider the number 5497555 to test if it is divisible by 7 or not. Add the last two digits to twice the remaining number and repeat the same process until it reduces to a two-digit number. If the result obtained is divisible by 7 the number is divisible by 7.*

- *55 + 2(54975) = 109950 + 55 = 110005*
- *05 + 2(1100) = 2200 + 05 = 2205*
- *05 + 2(22) = 44 + 5 = 49*

Reduced to the two-digit number 49, which is divisible by 7 i.e., 49 = 7 × 7

Divisibility Rule of 8

To check that any number is divisible by 8 we follow the divisibility rule for 8 that states, a number is divisible by 8 if last three digits of the number are divisible by 8.

> ***Example:*** *Check 49008 is divisible by 8 or not.*
>
> *taking last three digits of 49008, '008' which is divisible by 8, therefore, the number 49008 is divisible by 8.*

Divisibility Rule of 9

A number is divisible by 9 if the sum of its digits is divisible by 9. In example 90453, when we add the digits, we get the result as 21, which is not divisible by 9.

> ***Example****: 909, 5085, 8199, 9369 etc. are divisible by 9. Consider 909 (9 + 0 + 9 = 18). 18 is divisible by 9(18 = 9 × 2). Therefore, 909 is also divisible by 9.*

Divisibility Rule of 10

A number is divisible by 10 if it has only 0 as its last digit. A number that is divisible by 10 is divisible by 5, but a number that is divisible by 5 may or may not be divisible by 10.10 is divisible by both 5 and 10, but 55 is divisible only by 5, not by 10.

> ***Example:*** *89540, 3456780, 934260, etc are all divisible by 10.*

Divisibility Rule of 11

To check the divisibility rule for 11, if the difference of the sum of alternative digits of a number is divisible by 11, then that number is divisible by 11 completely.

Example: Let us consider a number to test the divisibility with 11, 264482240 mark the even place values and odd place values. Sum up the digits in even place together and sum up the digits in odd place together.

Digits	Place
2	1
6	2
4	3
4	4
8	5
2	6
2	7
4	8
0	9

Now sum up the digits in odd place values i.e., 2 + 4 + 8 + 2 + 0 = 14. To add up the digits in even place values i.e., 6 + 4 + 2 + 4 = 14

Now calculate the difference between the sum of digits in even place values and the sum of digits in odd place values if the difference is divisible by 11 the complete number i.e., 264482240 is divisible by 11. Here the difference is 0, (14-14) which is divisible by 11. Therefore, 264482240 is divisible by 11.

Practice Questions

1. Which number is divisible by 2? a) 15 b) 22 c) 27 d) 31
2. Which number is divisible by 5? a) 12 b) 17 c) 25 d) 33
3. Which number is divisible by 10? a) 34 b) 40 c) 47 d) 51
4. Is 18 divisible by 3? a) Yes b) No
5. Is 21 divisible by 7? a) Yes b) No
6. Which of these is divisible by 2 and 3? a) 7 b) 10 c) 12 d) 15
7. Which of these is divisible by 5 and 10? a) 15 b) 20 c) 27 d) 31
8. Is 36 divisible by 9? a) Yes b) No
9. Which number is divisible by 11? a) 23 b) 33 c) 44 d) 55
10. Which number is *not* divisible by 2? a) 14 b) 26 c) 39 d) 48
11. Which number is divisible by both 3 and 4? a) 10 b) 14 c) 24 d) 35
12. Which number is divisible by 6? a) 11 b) 15 c) 24 d) 31
13. Which number is divisible by 8? a) 20 b) 28 c) 36 d) 40
14. How many numbers between 1 and 30 are divisible by 5? a) 5 b) 6 c) 7 d) 8
15. Is 42 divisible by 2, 3, and 7? a) Yes b) No
16. Which of these is divisible by 9 but not by 3? a) 9 b) 18 c) 27 d) This is impossible.
17. A number is divisible by 2 and 9. What is the smallest possible value of this number? a) 6 b) 18 c) 36 d) 54
18. Which number leaves a remainder of 1 when divided by 5? a) 20 b) 21 c) 25 d) 30
19. Is 123 divisible by 3? a) Yes b) No
20. Which of the following is divisible by 11? a) 121 b) 122 c) 123 d) 124
21. A number is divisible by 4 and 6. What is the smallest *other* number (besides 0) that it could be divisible by? a) 8 b) 12 c) 24 d) 36
22. A number is divisible by 3, 5, and 2. What is the smallest possible sum of its digits? a) 3 b) 6 c) 9 d) 10
23. How many numbers between 100 and 200 are divisible by both 3 and 5? a) 6 b) 7 c) 8 d) 9
24. A number leaves a remainder of 2 when divided by 5 and a remainder of 3 when divided by 7. What is the smallest such number? a) 17 b) 23 c) 38 d) 43
25. The number 2A3 is divisible by 9. What is the value of A? a) 1 b) 4 c) 7 d) 9
26. A number is divisible by 8. Which of the following is *always* true? a) It is divisible by 4. b) It is divisible by 16. c) It is divisible by 2. d) Both a and c.
27. A number is divisible by 6 and 9. What other number must it be divisible by? a) 3 b) 12 c) 18 d) 54
28. How many three-digit numbers are divisible by 11? a) 81 b) 82 c) 90 d) 91
29. The digits of a three-digit number are all different and the number is divisible by 5. If the smallest digit is 2 and the largest digit is 8, what is the number? a) 258 b) 285 c) 825 d) 852
30. A number is divisible by 2, 3, 4, 6, 8, and 12. What is the smallest such positive number? a) 12 b) 24 c) 48 d) 72