

Class – V

Subject – Mathematics

Note:- Complete your work in fair copy, and do practice of remaining questions by your own in rough copy.

Chapter – 4

Tests of divisibility

A number is said to be exactly divisible by another number if the remainder is zero.

Here we can see the divisibility rule of 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 18, 25.

Divisibility rule of 2 :- Digit in the ones place is 0, 2, 4, 6 or 8.

Ex. 10, 44, 162, 9856, 14348 are divisible by 2.

Divisibility rule of 3 :- Sum of the digits is divisible by 3.

Ex. 2712, 9630, 432 are divisible by 3.

Divisibility rule of 4 :- Number formed by last two digits is divisible by 4.

Ex. 196, 1048, 24868 are divisible by 4.

Divisibility rule of 5 :- Digit in the ones place is 0 or 5.

Ex. 215, 80, 615, 13620 are divisible by 5.

Divisibility rule of 6 :- If a number is divisible by both 2 and 3, then it is divisible by 6.

Ex. 6714, 9126, 558 are divisible by 6.

Divisibility rule of 7 :- To test the divisibility by 7, first we twice the digit at ones place and subtract it from rest of the digits, if the difference is divisible by 7 then the given number is divisible by 7.

Ex. 378 , 455 are divisible by 7.

Divisibility rule of 8 :- Number formed by last three digits is divisible by 8.

Ex. 2968, 4256, 69384 are divisible by 8.

Divisibility rule of 9 :- Sum of the digits is divisible by 9.

Ex. 8694 , 8568, 4347 are divisible by 9.

Divisibility rule of 10 :- Digit in the ones place is 0.

Ex. 90, 510, 659020 are divisible by 10.

Divisibility rule of 11 :- A number is divisible by 11 if the difference between the sum of the digits at odd places and sum of the digits at even places is either 0 or a multiple of 11.

Ex. 2838, 9526 are divisible by 11

Divisibility rule of 12 :- We can write $12 = 3 \times 4$.

A number is divisible by 12 if it is divisible by both 3 and 4.

Ex. 123456, 79968 are divisible by 12.

Divisibility rule of 14 :- We can write $14 = 2 \times 7$.

A number is divisible by 14 if it is divisible by both 2 and 7.

Ex. 2086, 2996 are divisible by 14.

Divisibility rule of 15 :- We can write $15 = 3 \times 5$.

A number is divisible by 15 if it is divisible by both 3 and 5.

Ex. 88755, 92565 are divisible by 15.

Divisibility rule of 18 :- We can write $18 = 2 \times 9$.

A number is divisible by 18 if it is divisible by both 2 and 9.

Ex. 492480, 126558 are divisible by 18.

Divisibility rule of 25 :- If the number formed by last two digits of a number is divisible by 25 or if the last two digits are zero, then the given number is divisible by 25.

Ex. 9225, 10000 are divisible by 25.

Exercise – 1

Q. 1 Test the divisibility of the given numbers:

(a) 7390 by 2

Sol. Divisibility rule of 2 :- Digit in the ones place is 0, 2, 4, 6 or 8.

In 7390, ones place digit is 0. So 7390 is divisible by 2.

(b) 14348 by 2

Sol. Practice

(c) 628712 by 3

Sol. Divisibility rule of 3 :- Sum of the digits is divisible by 3.

In 628712, sum of the digits is $6 + 2 + 8 + 7 + 1 + 2 = 26$ which is not divisible by 3, therefore 628712 is not divisible by 3.

(d) 426564 by 3

Sol. Practice

(e) 24868 by 4

Sol. Divisibility rule of 4 :- Number formed by last two digits is divisible by 4.

In 24868, last two digits is 68 which is divisible by 4, therefore 24868 is divisible by 4.

(f) 20994 by 4

Sol. Practice

(g) 13624 by 5

Sol. Divisibility rule of 5 :- Digit in the ones place is 0 or 5.

In 13624, ones place digit is 4, therefore 13624 is not divisible by 5.

(h) 34875 by 5

Sol. Practice

(i) 6714 by 6

Sol. Divisibility rule of 6 :- If a number is divisible by both 2 and 3, then it is divisible by 6.

Divisibility rule of 2 :- Digit in the ones place is 0, 2, 4, 6 or 8.

In 6714, ones place digit is 4. So it is divisible by 2

Divisibility rule of 3 :- Sum of the digits is divisible by 3.

In 6714, sum of the digits is $6 + 7 + 1 + 4 = 18$ which is divisible by 3. So 6714 is divisible by 3

6714 is divisible by both 2 and 3, therefore it is divisible by 6.

(j) 9126 by 6

Sol. Practice

(k) 4256 by 9

Sol. Divisibility rule of 9 :- Sum of the digits is divisible by 9.

In 4256, sum of the digits is $4 + 2 + 5 + 6 = 17$ which is not divisible by 9. So 4256 is not divisible by 9

(l) 8568 by 9

Sol. Practice

(m) 659020 by 10

Sol. Divisibility rule of 10 :- Digit in the ones place is 0.

In 659020, ones place digit is 0. So it is divisible by 10.

(n) 967730 by 10

Sol. Practice

Q.2 Test the divisibility of the following numbers by 8:

(a) 8344

Sol. Divisibility rule of 8 :- Number formed by last three digits is divisible by 8.

In 8344 , last three digits is 344 which is divisible by 8.

Thus 8344 is also divisible by 8.

(b) 7413

Sol. Practice

(c) 32716

Sol. Divisibility rule of 8 :- Number formed by last three digits is divisible by 8.

In 32716, last three digits is 716 which is not divisible by 8.

Thus 32716 is also not divisible by 8.

(d) 5472

Sol. Practice

Q.3 Test the divisibility of the following numbers by 11:

(a) 5533

Sol. Divisibility rule of 11 :- A number is divisible by 11 if the difference between the sum of the digits at odd places and sum of the digits at even places is either 0 or a multiple of 11.

Sum of the digits at odd places = $3 + 5 = 8$

Sum of the digits at even places = $3 + 5 = 8$

Difference = $8 - 8 = 0$, difference is 0.

Thus 5533 is divisible by 11

(b) 26972

Sol. Practice

(c) 70169308

Sol. Divisibility rule of 11 :- A number is divisible by 11 if the difference between the sum of the digits at odd places and sum of the digits at even places is either 0 or a multiple of 11.

Sum of the digits at odd places = $8 + 3 + 6 + 0 = 17$

Sum of the digits at even places = $0 + 9 + 1 + 7 = 17$

Difference = $17 - 17 = 0$, difference is 0.

Thus 70169308 is divisible by 11.

(d) 100001

Sol. Practice

Q.4 Test the divisibility of the given numbers:

(a) 462654 by 18

Sol. Divisibility rule of 18 :- We can write $18 = 2 \times 9$.

A number is divisible by 18 if it is divisible by both 2 and 9.

Divisibility rule of 2 :- Digit in the ones place is 0, 2, 4, 6 or 8.

In 462654, ones place digit is 4. So 462654 is divisible by 2.

Divisibility rule of 9 :- Sum of the digits is divisible by 9.

In 462654, sum of the digits = $4 + 6 + 2 + 6 + 5 + 4 = 27$,

27 is divisible by 9. So 462654 is also divisible by 9.

462654 is divisible by both 2 and 9, therefore it is divisible by 18.

(b) 2873456 by 15

Sol. Divisibility rule of 15 :- We can write $15 = 3 \times 5$.

A number is divisible by 15 if it is divisible by both 3 and 5.

Divisibility rule of 3 :- Sum of the digits is divisible by 3.

In 2873456, sum of the digits = $2 + 8 + 7 + 3 + 4 + 5 + 6 = 35$,

35 is not divisible by 3. So 2873456 is also not divisible by 3.

Divisibility rule of 5 :- Digit in the ones place is 0 or 5.

In 2873456, ones place is 6. So 2873456 is not divisible by 5 .

2873456 is not divisible by both 3 and 5 , therefore it is not divisible by 15.

(c) 729250 by 25

Sol. Divisibility rule of 25 :- If the number formed by last two digits of a number is divisible by 25 or if the last two digits are zero, then the given number is divisible by 25.

In 729250, last two digits is 50 which is divisible by 25. Therefore 729250 is divisible by 25.

(d) 131726 by 14

Sol. Divisibility rule of 14 :- We can write $14 = 2 \times 7$.

A number is divisible by 14 if it is divisible by both 2 and 7.

Divisibility rule of 2 :- Digit in the ones place is 0, 2, 4, 6 or 8.

In 131726, ones place digit is 6. So 131726 is divisible by 2.

Divisibility rule of 7 :- To test the divisibility by 7, first we twice the digit at ones place and subtract it from rest of the digits, if the difference is divisible by 7 then the given number is divisible by 7.

Twice the digit at ones place , $6 \times 2 = 12$

Subtract it from rest of the digits, $13172 - 12 = 13160$

Again twice the digit at ones place, $0 \times 2 = 0$

Subtract it from rest of the digits, $1316 - 0 = 1316$

Again twice the digit at ones place, $6 \times 2 = 12$

Subtract it from rest of the digits, $131 - 12 = 119$

119 is divisible by 7. So 131726 is divisible by 7.

131726 is divisible by both 2 and 7 , therefore 131726 is divisible by 14.

(e) 147925 by 15

Sol. Practice

(f) 446520 by 12

Sol. Divisibility rule of 12 :- We can write $12 = 3 \times 4$.

A number is divisible by 12 if it is divisible by both 3 and 4.

Divisibility rule of 3 :- Sum of the digits is divisible by 3.

In 446520, sum of the digits = $4 + 4 + 6 + 5 + 2 + 0 = 21$

21 is divisible by 3. So 446520 is divisible by 3.

Divisibility rule of 4 :- Number formed by last two digits is divisible by 4.

In 446520, last two digits is 20 which is divisible by 4. So 446520 is divisible by 4 .

446520 is divisible by both 3 and 4 , therefore it is divisible by 12.