INDIAN SCHOOL NIZWA- WORKSHEET

Chapter 5 Number Play

Name: **Class :VIII Sec:**

1. A number has digital root 7. Which of the following can be its digital root after adding 9 to it?
   A) 7 B) 4 C) 1 D) 9
2. If a number leaves remainder 5 when divided by 12, then the number 10 more than it will leave remainder:
   A) 5 B) 3 C) 7 D) 1
3. Which of the following numbers has a digital root equal to its last digit?
   A) 6289 B) 5038 C) 1247 D) None of the above
4. If 52a7 is divisible by 9, the value of a must be:
   A) 3 B) 4 C) 5 D) 7
5. Which of the following numbers is **NOT** divisible by 11?
   A) 627 B) 143 C) 307 D) 935
6. Assertion (A): If a number has a digital root of 7, then adding 9 to the number does not change its digital root.
   Reason (R): Adding 9 to any number increases the sum of its digits by 9, which does not affect the digital root.
7. Assertion (A): All multiples of 12 are divisible by 3.
   Reason (R): The prime factorisation of 12 contains 3 as a factor.
8. The digital root of a number is 8.What will be the digital root of
   (i) the number + 1,
   (ii) the number + 2?
   Explain briefly.
9. A number leaves remainder 1 when divided by 3, 2, and 5, but is divisible by 7. It is less than 100. Find it.
10. The sum of three consecutive numbers is 48.
    (i) Write the numbers as algebraic expressions.
    (ii) Find the numbers.
11. Two numbers each leave remainder 5 when divided by 8.Show that their sum always leaves remainder 2 when divided by 8.Give one numerical example to justify.
12. Find all digits a and b for which the number 48ab3 is divisible by 9.Show your working using the sum-of-digits test.

13. A teacher wrote several numbers that give remainder 3 when divided by 10.She claims: "When any two such numbers are added, the result always ends with digit 6."Is this correct? Show using algebra and an example.
14. A number leaves remainder 1 when divided by 3, remainder 2 when divided by 4 and remainder 3 when divided by 5.Find the smallest such number .Explain the reasoning step by step.
15. A number leaves remainder 1 when divided by 2, remainder 2 when divided by 3, and remainder 3 when divided by 4.Find the smallest such number.
16. Find three consecutive numbers where
    • the first is divisible by 3,
    • the second is divisible by 4,
    • the third is divisible by 5.
    Are there infinitely many such triples? Explain.
17. If $8(5a – 3) – 6(7a + 4)$ is divisible by 12 for all whole numbers a, show that this is true using algebra. State clearly what makes the expression always divisible by 12.
18. Write four 6-digit multiples of 15 between 300000 and 400000, AND show whether reversing their digits keeps them divisible by 6. Explain your reasoning.
19. If 4a26b is divisible by 9, find all possible pairs (a,b)
20. Leela claims:
    "Any number that is divisible by 6 will remain divisible by 6 when its digits are reversed."
    Check whether the claim is always, sometimes, or never true, with examples and reasoning.
21. The middle number of five consecutive odd numbers is 7k – 1.Express all five numbers in terms of k, and find their sum.
22. Case study based question:
    A teacher asked students to explore the divisibility of numbers formed by different digit patterns. Four students—Arjun, Neha, Riya, and Kabir—created numbers using specific rules:

    - Arjun formed a 5-digit number where the sum of digits is 27.
    - Neha formed a 6-digit number that ends in 0 and is divisible by 9 and 10.
    - Riya formed a 4-digit number $72x4$ where the digit x is unknown.
    - Kabir formed a 6-digit number whose alternating sum of digits is 8.

    Answer the following:
    (a) For Arjun's number, explain whether the number can be divisible by 18.
    (Use divisibility rules.)
    (b) Neha's number is divisible by 9 and 10. State two conditions it must satisfy.
    (c) For Riya's number 72x4, determine all possible values of x such that the number is divisible by 4 and 3.

(d) Kabir's number has an alternating sum of 8.Is his number divisible by 11? Explain.

23. Case study based question:

A group of students explored divisibility using remainders and modular thinking.

They examined these statements:

- A number leaves remainder 7 when divided by 15.
- Another number leaves remainder 5 when divided by 20.
- A third number of the form 48a23b must be divisible by 18.
- They also looked for a 6-digit number divisible by 12, whose reverse is divisible by 9.

Answer the following:

(a) A number leaves remainder 7 when divided by 15.What remainder will it leave when divided by 3? Explain.

(b) A number leaves remainder 5 when divided by 20.Can it be divisible by 5? Justify your answer.

(c) For the number 48a23b to be divisible by 18, list the conditions needed for digits a and b, and find all possible pairs (a,b).

(d) A 6-digit number is divisible by 12, and its reversed number is divisible by 9.State the conditions each number must satisfy and give one possible example.

24. Revision:
    a. Add: 23.45, 7.608, 0.75, and 9.003
    b. If 345.6 ÷ 24 = 14.4, then find the value of 3456 ÷ 0.24.
    c. Divide: 6 2/3 ÷ 3 3/4
    d. Multiply: 18.25 × 4.08
    e. Simplify: (-2)/9 × 3/(-6) × (-18)/5
    f. Subtract: (-5)/12 from 7/8
    g. Find the LCM of 20, 36 and 48
    h. Find: (–72) ÷ (–9) × (–15) + 40
    i. Find: 30× (-8) × (-5) × (-3)