

CLASS 10 — MATHEMATICS

Chapter: Number Systems

Practice Worksheet | CBSE Pattern

Maximum Marks: 40

Time Allowed: 1 hour 30 minutes

Name: _____

Class/Section: _____ Date: _____

General Instructions:

1. All questions are compulsory.
2. Read each question carefully before answering.
3. Show complete working for questions requiring calculations or proofs.
4. Select only one option for each MCQ.
5. Marks for each question are indicated alongside the question.
6. Write mathematical steps clearly and use appropriate notation.

This paper has 21 questions in five sections: A (Q1–Q10, 1 mark each), B (Q11–Q15, 2 marks each), C (Q16–Q19, 3 marks each), D (Q20, 4 marks) and E (Q21, case study, 4 marks).

SECTION A

Multiple Choice Questions — Q1 to Q10 carry 1 mark each.

- Q1.** The prime factorisation of 156 is **[1 mark]**
(A) $2^2 \times 3 \times 13$ (B) $2 \times 3^2 \times 13$
(C) $2^2 \times 39$ (D) $2^3 \times 3 \times 13$
- Q2.** The HCF of two positive integers is 12 and their product is 1800. Their LCM is **[1 mark]**
(A) 12 (B) 1800
(C) 150 (D) 21600
- Q3.** The HCF of $2^3 \times 3^2 \times 5$ and $2^2 \times 3^3 \times 7$ is **[1 mark]**
(A) 6 (B) 216
(C) 7560 (D) 36
- Q4.** Which of the following numbers is irrational? **[1 mark]**
(A) $\sqrt{\frac{16}{9}}$ (B) $\frac{2\sqrt{3}}{3}$
(C) $\frac{\sqrt{12}}{\sqrt{3}}$ (D) $(5 + \sqrt{2}) - \sqrt{2}$
- Q5.** The LCM of 12, 15 and 21 is **[1 mark]**
(A) 210 (B) 1260
(C) 3 (D) 420

- Q6.** For a natural number n , the number 4^n can end with the digit [1 mark]
(A) 0 (B) 2
(C) 4 (D) 8

- Q7.** The number $3 \times 5 \times 7 \times 11 + 11$ is [1 mark]
(A) a prime number (B) a composite number
divisible by 11
(C) a composite number not (D) an odd number
divisible by 11

- Q8.** The least number greater than 24 which leaves a remainder 5 when [1 mark]
divided by 18 and also when divided by 24 is
(A) 72 (B) 67
(C) 149 (D) 77

In Q9 and Q10, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.

- Q9. Assertion (A):** $2\sqrt{7}$ is an irrational number. [1 mark]
Reason (R): The product of a non-zero rational number and an irrational number is irrational.
(A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

- Q10. Assertion (A):** $\text{HCF}(15, 40) \times \text{LCM}(15, 40) = 600$. [1 mark]
Reason (R): For any three positive integers p , q and r , $\text{HCF}(p, q, r) \times \text{LCM}(p, q, r) = p \times q \times r$.
(A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

SECTION B

Very Short Answer Questions — Q11 to Q15 carry 2 marks each.

Q11. Express 3150 as a product of its prime factors. **[2 marks]**

Q12. Given that $\text{HCF}(144, 198) = 18$, find $\text{LCM}(144, 198)$. **[2 marks]**

Q13. Check whether 15^n can end with the digit 0 for any natural number n . Justify your answer. **[2 marks]**

Q14. Given that $\sqrt{2}$ is irrational, prove that $4 - 3\sqrt{2}$ is irrational. **[2 marks]**

Q15. Find the largest number which divides 245 and 1029, leaving a remainder 5 in each case. **[2 marks]**

SECTION C

Short Answer Questions — Q16 to Q19 carry 3 marks each.

Q16. Prove that $\sqrt{7}$ is irrational.

[3 marks]

Q17. Find the HCF and LCM of 72, 120 and 180 using the prime factorisation method. Check whether $\text{HCF} \times \text{LCM}$ is equal to the product of the three numbers.

[3 marks]

Q18. Three bells ring at intervals of 9 minutes, 12 minutes and 15 minutes respectively. They ring together at 8:00 a.m.

[3 marks]

(a) At what time will they next ring together?

(b) How many times will they ring together after 8:00 a.m. and up to 6:00 p.m. on the same day?

Q19. Find the smallest natural number which is divisible by each of 8, 12 and 20 and is also a perfect square.

[3 marks]

SECTION D

Long Answer Question — Q20 carries 4 marks.

Q20. Given that $\sqrt{2}$ is irrational, prove that $\sqrt{2} + \sqrt{3}$ is irrational.

[4 marks]

SECTION E

Case Study Based Question — Q21 carries 4 marks.

- Q21.** A school is preparing identical stationery kits for a Science Fair. **[4 marks]**
The items available are given below.

Item	Number available
Notebooks	144
Pens	180
Pencils	240

Every kit must contain the same number of notebooks, the same number of pens and the same number of pencils, and no item should be left over.

Based on the above information, answer the following questions:

- (i) Write the prime factorisation of 180. **[1 mark]**

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- (ii) Find the LCM of 144 and 180. **[1 mark]**

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- (iii) What is the maximum number of identical kits that can be made? How many notebooks, pens and pencils will each kit contain? **[2 marks]**

— End of Question Paper —