

CBSE CLASS 10 MATHEMATICS

Chapter Practice Paper: Real Numbers

Maximum Marks: 40 | Suggested Time: 90 minutes

Based on the supplied NCERT Class 10 Mathematics chapter, Reprint 2026–27. Questions are original adaptations inspired by recurring board-exam patterns; they are not reproduced verbatim from any paper.

GENERAL INSTRUCTIONS

1. All questions are compulsory unless an internal choice is provided.
2. Show the prime-factorisation steps wherever required. For irrationality proofs, write a clear contradiction argument.
3. Calculators are not permitted. This is an independent practice resource, not an official CBSE paper.

SECTION A — Objective Questions ($8 \times 1 = 8$ marks)

1. If $756 = 2^a \times 3^b \times 7^c$, then $a + b + c$ is: (1)
(a) 5 (b) 6 (c) 7 (d) 8
2. Two positive integers are written as $m = p^4q^2$ and $n = p^2q^5$, where p and q are distinct primes. Their HCF is: (1)
(a) p^4q^5 (b) p^2q^2 (c) p^2q^5 (d) p^6q^7
3. The LCM of $2^3 \times 3^2$ and $2^2 \times 3 \times 5$ is: (1)
(a) $2^2 \times 3 \times 5$ (b) $2^3 \times 3^2 \times 5$ (c) $2^5 \times 3^3 \times 5$ (d) $2^3 \times 3^2$
4. If HCF of two positive integers is 9 and their LCM is 252, the product of the integers is: (1)
(a) 28 (b) 261 (c) 2268 (d) 243
5. Which statement is always true for two positive integers a and b ? (1)
(a) $\text{HCF}(a,b)$ is greater than $\text{LCM}(a,b)$ (b) $\text{HCF}(a,b)$ divides $\text{LCM}(a,b)$ (c) $\text{HCF}(a,b) + \text{LCM}(a,b) = ab$ (d) $\text{HCF}(a,b) = a + b$
6. The number of distinct prime factors in $2^2 \times 3^3 \times 11$ is: (1)
(a) 2 (b) 3 (c) 6 (d) 66
7. Assertion (A): $\sqrt{7}$ is irrational. Reason (R): If $\sqrt{7}$ were rational, it could be written as a fraction of two coprime positive integers, leading to both integers being divisible by 7. (1)
Choose: (a) Both A and R are true, and R explains A. (b) Both are true, but R does not explain A. (c) A is true, R is false. (d) A is false, R is true.
8. If a prime p divides a^2 , then p must divide: (1)
(a) a (b) p^2 only (c) $a + 1$ (d) no integer other than p

SECTION B — Very Short Answer Questions ($4 \times 2 = 8$ marks)

9. Express 1,260 as a product of prime factors in index form. (2)
10. Find the HCF and LCM of 84 and 126 using prime factorisation. (2)
11. Given $\text{HCF}(252, 594) = 18$, find their LCM. Show the relation used. (2)

12. Explain why $5 \times 7 \times 11 + 11$ is a composite number. (2)

SECTION C — Short Answer Questions ($4 \times 3 = 12$ marks)

13. Find the HCF and LCM of 168 and 252 by prime factorisation. Verify that $\text{HCF} \times \text{LCM}$ equals the product of the two numbers. (3)

14. A school has 96 red badges and 144 blue badges. They must be packed into the greatest possible number of identical kits, with no badges left over and the same number of each colour in every kit. Find (i) the number of kits and (ii) the number of each colour in a kit. (3)

15. Prove that $\sqrt{7}$ is irrational. (3)

16. Given that $\sqrt{3}$ is irrational, prove that $7 - 3\sqrt{3}$ is irrational. (3)

SECTION D — Case-Based Question ($1 \times 4 = 4$ marks)

17. A community centre has 108 notebooks and 180 pens. The organiser wants to prepare identical student packs using all the items, with every pack containing the same number of notebooks and the same number of pens. The number of packs should be as large as possible.

(a) Which mathematical concept should be used to find the maximum number of packs? (1)

(b) Find the maximum number of packs. (1)

(c) How many notebooks will be in each pack? (1)

(d) How many pens will be in each pack? (1)

SECTION E — Long Answer Questions ($2 \times 4 = 8$ marks)

18. Using prime factorisation, find the HCF and LCM of 180, 252 and 300. Show the prime factors and their powers clearly. (4)

OR

The HCF of two positive integers is 14 and their LCM is 840. If one integer is 70, find the other integer. (4)

19. Prove that $2 + 3\sqrt{7}$ is irrational, given that $\sqrt{7}$ is irrational. (4)

OR

Prove that $9 - 4\sqrt{2}$ is irrational, given that $\sqrt{2}$ is irrational. (4)