

1. Real Numbers 2020

1. The sum of exponents of prime factors in the prime-factorization of 196 is
(a) 3 (b) 4 (c) 5 (d) 2
2. Euclid's division Lemma states that for two positive integers a and b, there exists unique integer q and r satisfying $a = bq + r$, and
(a) $0 < r < b$ (b) $0 < r < b$ (c) $0 < r < b$ (d) $0 < r < b$
3. Prove that $\sqrt{5}$ is an irrational number.
4. The HCF of 135 and 225 is
(a) 15 (b) 75 (c) 45 (d) 5
5. The exponent of 2 in the prime factorization of 144, is
(a) 2 (b) 4 (c) 1 (d) 6
6. Show that $(12)^n$ cannot end with digit 0 or 5 for any natural number n.
7. Prove that $(\sqrt{2} + \sqrt{5})$ is irrational
8. $\left(\frac{2 + \sqrt{5}}{3}\right)$ is _____ number.
9. Given that $\text{HCF}(135, 225) = 45$, find the $\text{LCM}(135, 225)$.
10. After how many decimal places will the decimal representation of the rational number $\frac{229}{2^2 \times 5^7}$ terminate?
11. The LCM of two numbers is 182 and their HCF is 13. If one of the numbers is 26, find the other.
12. Show that $5 + 2\sqrt{7}$ is an irrational number, where $\sqrt{7}$ is given to be an irrational number.
13. Check whether 12^n can end with the digit 0 for any natural number n.
14. Use Euclid Division Lemma to show that the square of any positive integer is either of the form $3q$ or $3q + 1$ for some integer q.
15. The total number of factors of a prime number is
(a) 1 (b) 0 (c) 2 (d) 3
16. The LCM of the smallest two-digit number and the largest multiple of 6 which is less than 50 is
(A) 2
(B) 48
(C) 120
(D) 240

17. Write one irrational number between 0.15 and 0.21.
18. Find the HCF of 12, 18 and 30.
19. Assuming that $\sqrt{3}$ is an irrational number, prove that $5\sqrt{3} - 7$ is an irrational number.
20. If the HCF of 65 and 117 is written as $65m - 117$, then find the value of m.
21. The decimal representation of $\frac{117}{2^3 5^4 3^2}$ will
(A) terminate after 3 decimal places (B) terminate after 2 decimal places
(C) terminate after 4 decimal places (D) not terminate
22. The LCM of the smallest two-digit number and the largest multiple of 6 which is less than 50 is
(A) 2 (B) 48 (C) 120 (D) 240
23. The HCF and the LCM of 12, 21, 15 respectively are
(a) 3,140 (b) 12,420 (c) 3,420 (d) 420,3
24. Show that the square of any positive integer cannot be of form $(5q + 2)$ or $(5q + 3)$ for any integer q.
25. Using Euclid's Algorithm, find the largest number which divides 870 and 258 leaving remainder 3 in each case.
26. The decimal representation of $\frac{11}{2^3 \times 5}$ will
a) terminate after 1 decimal place
b) terminate after 2 decimal places
c) terminate after 3 decimal places
d) not terminate
27. The LCM of smallest two digit composite number and smallest composite number is
a) 12
b) 4
c) 20
d) 44
28. Write one rational and one irrational number lying between 0.25 and 0.32
29. Given that $\sqrt{5}$ is irrational, prove that $2\sqrt{5} - 3$ is an irrational number.

30. If HCF of 144 and 180 is expressed in the form $13m-16$. Find the value of m .

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