

BHARATIYA VIDYA BHAVAN'S V M PUBLIC SCHOOL, VADODARA
QUESTION BANK

CHAPTER 1 - REAL NUMBERS

1. Show that the square of any positive integer is either of the form $4q$ or $4q + 1$ for some Integer q .
2. Show that cube of any positive integer is of the form $4m$, $4m + 1$ or $4m + 3$, for some integer m .
3. Show that the square of any positive integer cannot be of the form $Sq + 2$ or $5q+3$ for any integer q .
4. Show that the square of any positive integer cannot be of the form $6m + 2$ or $6m + 5$ for any integer m .
5. Show that the square of any odd integer is of the form $4q+1$, for some integer q .
6. If n is an odd integer. Then show that n^2-1 is divisible by 8.
7. Prove that if x and y are both odd positive integers, then $x^2 + y^2$ is even but not divisible by 4.
8. Use Euclid's division algorithm to find the HCF of 441, 567,693.
9. Using Euclid's division algorithm, find the largest number that divides 1251, 9377 and 15628 leaving remainders 1, 2 and 3, respectively.
10. Prove that $\sqrt{3} + \sqrt{5}$ irrational.
11. Show that $l2^n$ cannot end with the digit 0 or 5 for any natural number n .
12. On a morning walk, three persons step off together and their steps measure 40cm, 42 cm and 45 cm, respectively. What is the minimum distance each should walk so that each can cover the same distance in complete steps?

13. Write the denominator of the rational number in the form $257/5000$ in the form of $2^m \times 5^n$ where m, n are non-negative integers. Hence, write its decimal expansion, without actual division.
14. Show that $3\sqrt{2}$ is an irrational no.
15. using the Euclid's division lemma, find HCF of 56, 88 and 404
16. Write the following rational numbers in decimal form:
 (i) $42/100$ (ii) $327/500$ (iii) $3\frac{3}{8}$ (iv) $5/6$ (v) $1/5$ (vi) $1/7$ (vii) $2/13$ (viii) $11/17$
17. Prove $\sqrt{11}$ is an irrational no.
18. If $\text{HCF}(120, 72) = 24$, find $\text{LCM}(120, 72)$.
19. Find the LCM and HCF of 144 and 90 by fundamental theorem of arithmetic.
20. Find the value of $\text{HCF} \times \text{LCM}$ for the numbers 1251 & 235.
21. Prove that $\sqrt{3}$ is irrational.
22. Prove that $3+2\sqrt{5}$ is an Irrational.
23. Show that any positive odd integer is of the form $4q + 1$ or $4q + 3$, where q is some integer.
24. Let n be an odd integer. Then the number of real roots of the polynomial equation $P_n(x) = 1+2x+3x^2+\dots+(n+1)x^n$ is
 (a) 0
 (b) n
 (c) 1
 (d) none of these
25. Find the largest number that divides 2623 and 2011, leaving 5 and 9 as remainders respectively.
26. If d is the HCF of 45 and 27. Find x and y satisfying $d=27x+45y$.

27. Show that the cube of a positive integer of the form $6q + r$, q is an integer and $r = 0, 1, 2, 3, 4, 5$ is also of the form $6m + r$.
28. Prove that one and only one out of $n, n+2$ and $n+4$ is divisible by 3, where n is any positive integer.
29. Prove that one of any three consecutive positive integers must be divisible by 3.
30. For any positive integer n , prove that $n^3 - n$ is divisible by 6.
31. Show that one and only one out of $n, n+4, n+8, n+12$ and $n+16$ is divisible by 5, where n is any positive integer.
[Hint: Any positive integer can be written in the form $5q, 5q+1, 5q+2, 5q+3, 5q+4$].
32. If a is a positive rational number and n is a positive integer greater than 1, prove that a^n is a rational number.
33. Find the HCF of 21658 and 8624, using Euclid's division algorithm.
34. Find the largest number that divides 398, 436 and 542, leaving 7, 11 and 15 as remainders respectively.
35. Given that $\text{HCF}(435, 725) = 145$, find $\text{LCM}(435, 725)$.
36. Given that $\text{LCM}(396, 576) = 6336$, find $\text{HCF}(396, 576)$.
37. Is 23.123456789 rational or irrational? What can you say about the prime factors of q if it can be written in the form of p/q ?
38. If the HCF of 65 and 117 is expressible in the form $65m + 117n$ then find the value of m .
39. If the product of two numbers is 5780 and their HCF is 17, then find their LCM.
40. Which of the following rational numbers have terminating decimal? Represent them as decimals.

$16/625, 5/18, 2/21, 7/250, 125/441, 33453/1200, 441/2^2 \cdot 5^7 \cdot 7^2, 16584/625, 13/80$

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