Class X WORKSHEET 2

1. If the HCF of 152 and 272 is expressible in the form 272×8+152x, then find x.
2. Use Euclid Algorithm to find HCF of 4052 and 12576.
3. Prove that if x and y are both odd positive integers, then $x^2 + y^2$ is even but not divisible by 4.
4. Prove that one of any three consecutive positive integers must be divisible by 3.
5. For any positive integer n, prove that $n^3 - n$ is divisible by 6.
6. For any integer a and 3, there exist a unique integers q and r such that a=3q+r. Find the possible values of r.
7. Euclid's division lemma states that for two positive integers a and b, there exists a unique integers q and r such that a=bq+r.
8. Apply Euclid's Algorithm to find the HCF of numbers 4052 and 420.
9. Show that any positive odd integer is of the form 4q+1 or 4q+3, where q is some integer.
10. Show that every positive even integer is of the form 2q, and that every positive odd integer is of the form 2q+1, where q is some integer.
11. Show that any positive odd integer is of the form 6q+1 or 6q+3 or 6q+5, where q is some integer.
12. Use Euclid's algorithm to find the HCF of 595 and 252 and express it in the form 595m+252n.
13. Use Euclid's division 726 and 275 and algorithm to find the HCF of 726 and 275 and express it in the form 726m+275n.
14. A class of 20 boys and 15 girls is divided into n groups so that each group has x boys and y girls. Find the values of x, y and$n$. What values are referred in class?
15. Use Euclid's division lemma to show that the cube of any positive integer is of the form 9m, 9m+1 or 9m+8.
16. Prove that the product of any three consecutive positive integers is divisible by 6.
17. On a morning walk, three persons step off together and their steps measure 40cm, 42cm and 45cm, respectively. What is the minimum distance each should walk so that each can cover the same distance in complete steps?
18. Explain why 3×5×7+7 is a composite number.
19. Write the HCF of the smallest composite number and the smallest prime number.
20. Using Fundamental Theorem of Arithmetic, find the LCM and HCF of 816 and 170.
21. Four bells toll at an interval 8, 12, 15 and 18 seconds, respectively. All the four begin to toll together. How many times will they toll together in one hour excluding the one at the start?
22. Can the number 6^n, n being a natural number, end with the digit 5? Give reasons.
23. The HCF of 45 and 105 is 15. Find their LCM.
24. Explain why 7×11×13+13 and 7×6×5×4×3×2×1+5 are composite numbers.
25. If the HCF of 144 and 180 is expressed in the form 13m-3, find the value of m.

26. Show that 9^n cannot end with digit 0 for any natural number n.

27. If two positive integers p and q are written as $p = a^2b^3$ and $q = a^3b$; a and b being prime numbers, the verify LCM (p, q) ×HCF (p, q) = pq.

28. Show that 12^n cannot end with the digit 0 or 5 for any natural number n.

29. If m and n are odd positive integers, then $m^2 + n^2$ is even but divisible by 4. Justify.

30. Find the HCF of 65 and 117 and find a pair of integral values of m and n such that HCF = $65m+117n$.

31. Find the greatest number of 6 digits which is exactly divisible by 24, 15 and 36.

32. Find HCF and LCM of 1376 and 15428 using Fundamental Theorem of Arithmetic.

33. Prove that $\sqrt{p} + \sqrt{q}$ is irrational where p and $q$are primes.

34. Show that $5 - \sqrt{3}$ is an irrational number.

35. Write a rational number between $\sqrt{2}$ and $\sqrt{3}$.

36. If $\frac{p}{q}$ is a rational number $(q \neq 0)$, what is the condition on q so that the decimal representation of p and q is terminating?

37. Write whether the rational number $\frac{51}{1500}$ will have a terminating decimal expansion or a non- terminating repeating decimal expansion.

38. Write whether $\frac{2\sqrt{45}+3\sqrt{20}}{2\sqrt{5}}$ on simplification gives a rational or a irrational number.

39. Write whether the rational number $\frac{7}{35}$ will have terminating decimal expansion or a non-terminating repeating decimal expansion.

40. Prove that $2 + \sqrt{3}$ is irrational.

41. Show that $7 - 2\sqrt{5}$ is irrational.

42. Without actually performing the long division, state whether the following rational numbers will have a terminating decimal expansion or a non-terminating repeating decimal expansion.

43. $\frac{17}{8}$ b. $\frac{15}{1600}$ c. $\frac{64}{455}$

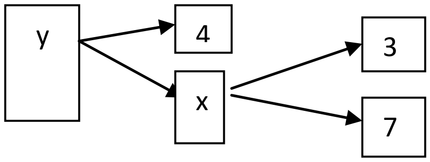
44. Write down the decimal expansion of the following rational numbers by writing their denominators in the form 2^n5^m , where n and m are non negative integers.

45. $\frac{3}{5}$ b. $\frac{13}{80}$ c. $\frac{127}{500}$

46. Express the number $0.3178178178178\ldots$ in the form of rational number $\frac{a}{b}$.

47. Find the number which when divided by 47 gives 23 as quotient and 37 as remainder.

48. Find the value of x and y in the given figure:



49. Prove that $7 - 2\sqrt{3}$ is a irrational number.

50. Without actually performing the long division, state whether the rational number $\frac{17}{320}$ will have a terminating decimal expansion or non-terminating repeating decimal expansion.

51. Find the largest positive integer that will divide 100, 245 and 343 leaving remainders 4, 5 and 7 respectively.

52. Prove that $\left(3 + 2\sqrt{5}\right)^2$ is irrational.

53. If d is HCF of 45 and 27, find x and y satisfying $d = 27x + 45y$.

54. State whether $\frac{6}{200}$ has a terminating or non-terminating repeating decimal expansion.

55. If two positive integer c and d are written as $c = xy^2$ and $d = x^3y$, where x and y are prime numbers, then find their LCM (c, d).

56. Find the least number that is divisible by first five even numbers.

57. Show that the square of any odd integer is of the form $4q + 1$ for some integer q.

58. Show that one and only one out of n, $n+2$, $n+4$ is divisible by 3, where n is any positive integer.