CLASS XA & XB
MATHS HHW(WINTER BREAK)2022-23

★ **Do 10 sample paper one daily in fair copy with sample question paper**

WORKSHEET

1. Show that the number 6^n never end with digit 0 for any natural number n.
2. Show that (7 x 13 x 11) +11 and (7 x 6 x 5 x 4 x 3 x 2 x 1) + 3 are composite numbers.
3. Find HCF and LCM of 625, 1125 and 2125 using prime factorisation.
4. Prove that $\sqrt{3}$ is an irrational number.
5. Prove that $\sqrt{5}$ is an irrational number.
6. Prove that $\sqrt{2} + \sqrt{3}$ is an irrational number
7. If HCF of 510 and 92 is 2, then find the LCM.
8. Find the value of 'a', if HCF (a, 18) = 2 and LCM (a, 18) = 36.
9. The HCF of two numbers is 9 and their LCM is 2016. If the one number is 54, then find the other number.

10. If α, β are the zeroes of the polynomial $P(x) = 4x^2 + 3x + 7$, then find the value of .

11. If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then find the value of k.

12. If p and q are the zeroes of the quadratic polynomial $f(x) = 2x^2 - 7x + 3$, find the value of $p + q - pq$.

13. If one zero of the quadratic polynomials: is 2, then find the value of k.

14. Find the zeros of the polynomial , and verify the relation between the coefficients and zeros of the polynomial.

15. If the sum of the zeroes of the polynomial $p(x) = (k^2 - 14) x^2 - 2x - 12$ is 1, then find the value of k.

16. Find whether the following pair of linear equations is consistent or in consistent: $3x + 2y = 8$ and $6x - 4y = 9$.

17. Find the value of k for which the lines $5x + 7y = 3$ and $15x + 21y = k$ coincides.

18. If $x = a$ and $y = b$ is the solution of the pair of equations $x - y = 2$ and $x + y = 4$, find the values of a and b.

19. If the system of equations $6x - 2y = 3$ and $kx - y = 2$ has a unique solution, find k.

20. For what values of k will the following pair of linear equations have infinitely many solutions? $kx + 3y - (k - 3) = 0$ and $12x + ky - k = 0$

21. Solve: $2x + 3y = 11$ and $2x - 4y = - 24$

22. If $217x + 131y = 913$, $131x + 217y = 827$, then find the value of x and y

23. A part of monthly hostel charges in a college is fixed and the remaining depends on the number of days one has taken food in the mess. When a student 'A' takes food for 22 days, he has to pay Rs. 1380 as hostel charges; whereas a student 'B', who takes food for 28 days, pays Rs. 1680 as hostel charges. Find the fixed charges and the cost of food per day.

24. Meena went to a bank to withdraw Rs 2,000. She asked the cashier to give her Rs. 50 and Rs. 100 notes only. Meena got 25 notes in all. How many notes of Rs. 50 and Rs. 100 she received?

25. The ratio of income of two persons is 9 : 7 and the ratio of their expenditure is 4 : 3, if each of them manage to save Rs. 2000/month. Find their monthly incomes.

26. For what value of k does $(k-12)x^2 + 2(k-12)x + 2 = 0$ have equal roots?

27. Find the value of p so that the quadratic equation $px(x-3) + 9 = 0$ has equal roots.

28. If $(1-p)$ is a root of the equation $x^2 + px + 1 - p = 0$, then find the roots.

29. Solve for x: $4x^2 - 2(a^2 + b^2)x + a^2 b^2 = 0$.

30. The sum of the squares of three consecutive positive integers is 50. Find the integers.

31. A train travels 360km at a uniform speed. If the speed had been 5km/hr more, would have taken 1 hour less for the same journey. Find the speed of the train.

32. Two water taps together can fill a tank in 9 hours. The larger tap takes 10 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.

33. An express train takes 1 hour less than a passenger train to travel 132 km between Mysore and Bangalore (without taking into consideration the time they stop at intermediate stations). If the average speed of the express train is 11km/h more than that of the passenger train, find the average speed of the two trains.

34. A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream

35. Find the value of k if P(4, –2) is the mid-point of the line segment joining the points A(5k, 3) and B(–k, –7).

36. Find the point on y-axis which is equidistant from the points (5, –2) and (–3, 2).

37. What point on the x-axis is equidistant from (7, 6) and (– 3, 4)?

38. If the points A(4, 3) and B(x, 5) are on the circle with the centre O(2, 3), find the value of x.

39. In what ratio does the point (– 4, 6) divide the line segment joining the points A(– 6, 10) and B(3, – 8)?

40. Find the coordinates of the points of trisection of the line segment joining the points A(2, – 2) and B(– 7, 4).

41. If (1, 2), (4, y), (x, 6) and (3, 5) are the vertices of a parallelogram taken in order, find x and y.

42. Prove that the lengths of the tangents drawn from an external point to a circle are equal.

43. Prove that the tangent to a circle is perpendicular to the radius through the point of contact.

44. Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle$ PTQ = 2 $\angle$ OPQ.

45. PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T. Find the length TP.

46. Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.

47. If XY and X′Y′ are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting XY at A and X′Y′ at B. Prove that $\angle$ AOB = 90°.

48. Prove that the parallelogram circumscribing a circle is a rhombus.

49. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

50. The radii of 2 cylinders are in the ratio 2 : 3 and their heights are in the ratio 5 : 3. Then, find the ratio of their volumes.

51. Two volumes of two spheres are in the ratio 64 : 27. Find the ratio of their surface areas.

52. A vessel is in the form of an inverted cone. Its height is 8 cm and the radius of its top, which is open, is 5 cm. It is filled with water up to the brim. When lead shots, each of which is a sphere of radius 0.5 cm are dropped into the vessel, one-fourth of the water flows out. Find the number of lead shots dropped in the vessel.

53. A pen stand made of wood is in the shape of a cuboid with four conical depressions to hold pens. The dimensions of the cuboid are 15 cm by 10 cm

by 3.5 cm. The radius of each of the depressions is 0.5 cm and the depth is 1.4 cm. Find the volume of wood in the entire stand.

54. Ramesh made a bird-bath for his garden in the shape of a cylinder with a hemispherical depression at one end. The height of the cylinder is 1.45 m and its radius is 30 cm. Find the total surface area of the bird-bath.

55. A juice seller was serving his customers using glasses as shown in below figure. The inner diameter of the cylindrical glass was 5 cm, but the bottom of the glass had a hemispherical raised portion which reduced the capacity of the glass. If the height of a glass was 10 cm, find the apparent capacity of the glass and its actual capacity. (Use $\pi = 3.14$.)

56. A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the total height of the vessel is 13 cm. Find the inner surface area of the vessel.

57. A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy.

58. A cubical block of side 7 cm is surmounted by a hemisphere. What is the greatest diameter the hemisphere can have? Find the surface area of the solid.

59. A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends. The length of the entire capsule is 14 mm and the diameter of the capsule is 5 mm. Find its surface area.

60. If the perimeter of a semi-circular protractor is 108 cm, find the diameter of the protractor. (Take $\pi = 22/7$)

61. If the area of a circle is 154 cm^2, then find its circumference.

62. The circumference of a circle is 100 cm. Find the side of a square inscribed in the circle.

63. If a square ABCD inscribed in a circle of radius r and AB= 4cm , then find the value of r

64. The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minutes.

65. A horse is tied to a pole with 28 m long rope. The perimeter of the field where the horse can graze is (Take $\pi = 22/7$)

66. An umbrella has 8 ribs which are equally spaced. Assuming the umbrella to be a flat circle of radius 45 cm, find the area between the two consecutive ribs of the umbrella.

67. Two circular pieces of equal radii and maximum area, touching each other are cut out from a Rectangular card board of dimensions 14 cm × 7 cm. Find the area of the remaining card board. [Use $\pi = 22/7$]

68. The length of the minute hand of a clock is 6cm. Find the area swept by it when it moves from 7:05 p.m. to 7:40 p.m.

69. A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding : (i) minor segment (ii) major sector. (Use $\pi = 3.14$)