**Class: X**   **Mathematics-Basic (241)**

1. Find the HCF of 1260 and 7344 using Euclid's algorithm. (36)
2. What is the HCF of smallest prime number and the smallest composite number? (2).
3. Find HCF and LCM of 404 and 96 and verify that HCF x LCM = product of two given numbers.
4. Find the LCM of 6, 72 and 120, using prime factorisation method.
5. Prove that $\sqrt{5}$ is irrational.
6. Prove that $\sqrt{3}+2$ is irrational.
7. Use Euclid's lemma to division show that the cube of any positive integer is either of the form $9m, 9m+1, 9m+8$ for some integer m
8. Show that the square of any positive integer is of the form $3m \, or \, 3m+1$ for some integer m.
9. Find the zeros of the following polynomials and verify the relationship
    (i) $8y^2 - 16y$ (ii) $\sqrt{3}x^2 + 10x + 7\sqrt{3}$ (iii) $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$ (iv) $6x^2 - 3 - 7x$
10. If $\alpha \, and \, \beta$ are the zeroes of the polynomial $p(x) = x^2 - 5x + 6$ then find the value of $\alpha + \beta$.
11. If one zero of the polynomial $f(x) = (k^2 + 4)x^2 + 13x + 4k$ is reciprocal of the other, then find the value of k .
12. If two zeros of the polynomial $f(x) = x^4 - 6x^3 - 26x^2 + 138x - 35$ are $2 \pm \sqrt{3}$,then find other zeros.
13. If $\alpha \, and \, \beta$ are the zeros of the quadratic polynomial $f(x) = x^2 - 5x + 4$ then find the values of (i) $\alpha - \beta$ (ii) $\alpha^3 - \beta^3$
14. Solve: $x + y = 14; x - y = 4$.
15. Yudith scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks been deducted for each incorrect answer, then Yudith would have scored 50 marks. How many questions were there in the test?

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

17. A boat covers 32 km upstream and 36 km downstream in 7 hours. Also , it covers 40 km upstream and 48 km downstream in 9 hours. Find the speed of the boat in still water and the of the stream.

18. Solve: $\dfrac{10}{x+y} + \dfrac{2}{x-y} = 4,\ \dfrac{15}{x+y} - \dfrac{5}{x-y} = -2.$

19. A train travels a distance of 480 km at a uniform speed. If the speed had been 8km/hr less, then it would have taken 3 hours more to cover the same distance. We need to find the speed of the train.

20. Solve the quadratic equation $2x^2 - x + \dfrac{1}{8} = 0$.

21. Find the nature of the roots of $2x^2 - 4x + 3 = 0$.

22. Write all the values of p for which the quadratic equation $x^2 + px + 16 = 0$ has equal roots. Find the roots of the equation so obtained.

23. If x = 3 is one root of the quadratic equation $x^2 - 2kx - 6 = 0$, then find the value of 'k'.

24. Check whether -150 is a term of the AP: 11, 8, 5, 2,...

25. How many terms of the AP: 24, 21, 18,... must be taken so that their sum is 78?

26. Given a = 2, d = 8, $S_n = 90$, find $n\ and\ a_n$.

27. The sum of the third and seventh terms of an AP is 6 and their product is 8. Find the sum of first sixteen terms of an AP.

28. Prove that the area of an equilateral triangle described on one side of a square is equal to half the area of the equilateral triangle described on one of its diagonals.

29. A decorative block shown in fig., is made of two solids- a cube
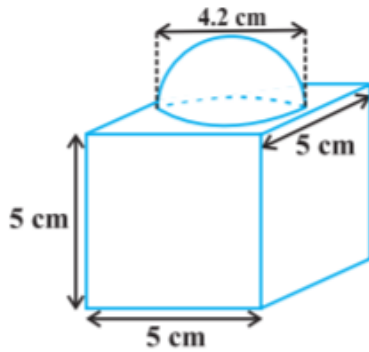
and a hemisphere. The base of the block is a cube with edge 5 cm, and the hemisphere fixed on the top has a diameter 4.2 cm. Find the total surface area of the block.

30. A circular tent is cylindrical up to a height of 3m and conical above it. If the diameter of the base is 105 m and the slant height of the conical part is 53 m , find the total canvas used in making the tent.

31. A solid toy is in the form of a hemisphere surmounted by a right circular cone. Height of the cone is 2 cm and the diameter of the base is 4cm. If a right circular cylinder circumscribe the solid. Find how much more space it will cover.

32. Diagonals AC and BD of a trapezium ABCD with AB parallel to DC intersect each other at the point O. Using similarity criterion for two triangles $\dfrac{OA}{OC} = \dfrac{OB}{OD}$.

33. Prove: the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

34. A cone of height 24 cm and radius of base 6 cm is made up of modelling clay. A child reshapes it in the form of a sphere. Find the radius of the sphere.