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Holiday Assignment class - \bar{x}

1. Use Euclid's division algorithm to find the HCF of:
a) 96 and 404 (b) 84 and 108.
2. Show that any positive odd integer is of the form $6q+1$, $6q+3$ or $6q+5$, where q is some integer.
3. Use Euclid's division lemma to show that the square of any positive integer is either of the form $3m$ or $3m+1$, for some integer m .
4. Check whether $(21)^n$ ends with the digit zero, for any value of n , where n is a natural number.
5. Find the LCM and HCF of 126 and 36 by the fundamental theorem of Arithmetic.
6. Is $9 \times 11 \times 13 \times 15 \times 17 + 15$ a composite number?
7. Given the $\text{HCF}(510, 92) = 2$, find its LCM.
8. Prove that $\sqrt{7}$ is an irrational number.
9. Prove that $5 - 2\sqrt{3}$ is an irrational number.
10. Prove that $\sqrt{2} + \sqrt{5}$ is irrational.
11. Find the zeroes of the following polynomials and verify the relationships between the zeroes and their coefficients:
(i) $x^2 - 2x - 8$ (ii) $x^2 + 10x + 21$.
12. Form the quadratic polynomial whose sum and product of its zeroes are 5 and -3 respectively.

13. Divide $f(x) = 8x^4 + 14x^3 - 2x^2 + 7x - 8$ by $g(x) = 4x^2 + 3x - 2$.

14. Find all the zeroes of the polynomial $x^4 + x^3 - 34x^2 - 4x + 120$, if two of its zeroes are a and $-a$.

15. Find all the zeroes of $2x^3 + x^2 - 6x - 3$ if two of its zeroes are $-\sqrt{3}$ and $\sqrt{3}$.

16. Solve graphically the system of equations:

$$x + y = 3$$

$$3x - 2y = 4.$$

17. Solve the following equations by the method of substitution:

$$8x + 5y = 9$$

$$3x + 2y = 4.$$

18. Solve by the method of cross multiplication:

$$2x - y - 3 = 0$$

$$4x + y - 3 = 0.$$

19. Solve: $\frac{x}{7} + \frac{y}{3} = 5$

$$\frac{x}{2} - \frac{y}{9} = 6.$$

20. Solve: $\frac{3}{x} - \frac{1}{y} = -9$

$$\frac{2}{x} + \frac{3}{y} = 5.$$

21. Find the value of k for which the given system of equations has infinitely many solutions:

(2)

(i) $5x + 2y = k$
 $10x + 4y = 3.$

(ii) $2x - 3y = 7$
 $(k+2)x - (2k+1)y = 3(2k-1)$

(iii) $x + (k+1)y = 4$
 $(k+1)x + 9y = 5k+2.$

22) 5 books and 7 pens together cost Rs. 79, whereas 7 books and 5 pens together cost Rs. 77. Find the total cost of 1 book and 2 pens.

23) The sum of two numbers is 35 and their difference is 13. Find the numbers.

24) A fraction becomes $\frac{1}{3}$ if 1 is subtracted from both its numerator and denominator. If 1 is added to both the numerator and denominator, it becomes $\frac{1}{2}$. Find the fraction.

25) Ten years ago, a father was twelve times as old as his son, and ten years hence, he will be twice as old as his son will be then. Find their present ages.

26) The taxi charges in a city comprise of a fixed charge together with the charge for the distance covered. For a journey of 12 km, the charge paid is Rs. 89 and for a journey of 20 km, the charge paid is Rs. 145. What will a person have to pay for travelling a distance of 30 km?

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