

D.A.V PUBLIC SCHOOL, KURUKSHETRA
SUMMER VACATION ASSIGNMENT
CLASS XI
SUBJECT – MATHEMATICS

Q :-1 Find the number of non zero integral solutions of the equation

$$|1-i|^x = 2^x.$$

Q :-2 Find the value of $i^n + i^{n+1} + i^{n+2} + i^{n+3}$, $n \in \mathbb{N}$.

Q :-3 Express in a+ib form of

$$\left[\left(\frac{1}{3} + i\frac{7}{3}\right) + \left(4 + i\frac{1}{3}\right) - \left(-\frac{4}{3} + i\right)\right]$$

Q :-4 Find the value of x which satisfy the equation.

$$a^2x^2 - 2a^3x + a^4 + a^4 + c^2 = 0$$

Q:-5 Solve $-12x > 30$ when x is an integer.

Q:-6 Find sum of odd integers from 1 to 2001.

Q:-7 Find the 20th term of $\frac{5}{2}, \frac{5}{4}, \frac{5}{8}, \dots$

Q:-8 Evaluate : $\sum_{k=1}^{11} (2 + 3^k)$

Q:9 find sum to infinity in

$$\frac{-3}{4}, \frac{3}{16}, \frac{-3}{64}, \dots$$

Q10. If P (n) is the statement “ $n^3 + n$ is divisible by 3”. Is P (4) is true?

Q11. If α and β are different complex Numbers with $|\beta| = 1$ then find $\left[\frac{\beta - \alpha}{1 - \alpha\beta}\right]$

Q 12.If $(a+ib) (c + id) (e + if) (g + ih) = A + iB$ then show that

$$(a^2+b^2) (c^2+d^2) (e^2+f^2) (g^2+h^2) = A^2+B^2$$

Q13. Reduce $\left(\frac{1}{1-4i} - \frac{2}{1+i}\right)\left(\frac{3-4i}{5+i}\right)$ to the standard form.

Q 14. Solve $x^2 + \left(\frac{ax}{x+a}\right)^2 = 3a^2, x \neq -a$

Q 15. Solve $\frac{1}{p+q+x} = \frac{1}{p} + \frac{1}{q} + \frac{1}{x}$

Q 16. Solve the following system of inequations:

$$\frac{x}{2x+1} \geq \frac{1}{4}, \frac{6x}{4x-1} < \frac{1}{2}$$

Q 17. Solve the following system of inequalities :

$$\frac{4x+3}{2x-5} < 6, x \neq \frac{5}{2}$$

Q 18. Solve $:\frac{|x|-1}{|x|-2} \geq 0, x \in \mathbb{R}, x \neq \pm 2$

Q19. Find the solution set of the following system of linear inequations graphically:

$$2x + 3y - 12 \geq 0$$

$$2x - y + 2 \geq 0$$

$$3x - 4y + 12 \geq 0$$

$$x \leq 4, y \geq 2$$

Q 20. Using P.M.I, prove that for all $n \in \mathbb{N}$.

$$1 + \frac{1}{1+2} + \frac{1}{1+2+3} + \dots + \frac{1}{1+2+3+\dots+n} = \frac{2n}{n+1}$$

Q21. Using P.M.I prove that

$$7^{2n} + 2^{3n-3} * 3^{n-1}$$

is divisible by 25 for all $n \in \mathbb{N}$.

Q22. The ratio of the A.M and G.M between two positive number a and b is m:n show that

$$a:b = (m + \sqrt{m^2 - n^2}) : (m - \sqrt{m^2 - n^2})$$

Q 23. If a,b,c are in A.P. b,c,d are in G.P. and $\frac{1}{c}, \frac{1}{d}, \frac{1}{e}$ are in A.P. prove that a,c,e are in G.P.

Q 24. Find the sum of the series up to n terms.

$$\frac{1^3}{1} + \frac{1^3 + 2^3}{1 + 3} + \frac{1^3 + 2^3 + 3^3}{1 + 3 + 5} + \dots$$

Q 25. Let S be sum, P be product and R the sum of the reciprocals of n terms in a G.P.

prove that $P^2 R^n = S^n$