

HOLY ANGELS' ISC SCHOOL, NANTHENCODE
UNIT TEST- AUGUST 2024

Std. X

MATHEMATICS

Marks: 25

Time : 1 hr

1. What number should be subtracted from $16x^3 - 8x^2 + 4x + 7$ so that the resulting polynomial has $2x + 1$ as its factor? [1]

a. -1 b. 4 c. 1 d. -4

2. If $A = \begin{bmatrix} 2 & -3 \\ -1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$, then AB is: [1]

a. $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ b. $\begin{bmatrix} 0 & 1 \\ 0 & 1 \end{bmatrix}$ c. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ d. $\begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}$

3. If $x, 6, 18, y$ are in continued proportion, then the values of x and y are: [1]

a. 18, 27 b. 54, 9 c. 2, 54 d. 1, 3

4. An arithmetic progression (A.P.) has 40 terms. Its third term is 12 and the last term is 86. Find the

a) First term and Common difference
 b) Sum of its first 16 terms

[3]

5. The polynomial $3x^3 + 8x^2 - 15x + k$ has $(x-1)$ as a factor. Find the value of 'k'. Hence factorize the resulting polynomial completely. [3]

6. 15, 30, 60, 120, are in G.P. (Geometric Progression)

a. Find the n^{th} term of this GP.

b. How many terms of the above GP will give the sum 3825? [3]

7. If a, b, c are in continued proportion. Prove that $(a + b + c)(a - b + c) = a^2 + b^2 + c^2$ [3]

8. If $A = \begin{bmatrix} 4 & -4 \\ -4 & 4 \end{bmatrix}$, find A^2 . If $A^2 = pA$, then find the value of 'p'. [3]

9. The geography teacher of a school planned an educational trip. The travel agent quoted a price of R 4800 per student for a certain number of days. Later, the trip was extended by 2 more days. Teacher requested the agent not to charge any extra amount. To keep the total expenditure unchanged, the travel agent reduced the expenses of each student by Rs 80 per day. What was the duration of the trip originally? [3]

10. If $\frac{x+1}{x-1} = \frac{\sqrt{3y+2} + \sqrt{3y-2}}{\sqrt{3y+2} - \sqrt{3y-2}}$ using properties of proportion show that $y = \frac{2(x^2+1)}{3(x^2-1)}$ [4]