

# ARCHITA EDUCENTER

## CLASS-X MATHS-MOCK-TEST-3

1. When  $2x^3 - 9x^2 + 10x - p$  is divided by  $(x+1)$ , the remainder is  $-24$ . Find the value of  $p$ .

2. Use factor theorem to factorise the following polynomials completely:  
 $4x^3 + 4x^2 - 9x - 9$ .

3. If  $x^3 - 2x^2 + px + q$  has a factor  $(x+2)$  and leaves a remainder 9 when divided by  $(x+1)$ , find the value of  $p$  and  $q$ . with these values of  $p$  and  $q$ , factorise the given polynomial completely.

4. If  $(2x+1)$  is a factor of both the expressions  $2x^2 - 5x + p$  and  $2x^2 + 5x + q$ , find the values of  $p$  and  $q$ . hence, find the other factors of both the polynomials.

5. If the mean of the following distribution is 7.5, find the missing frequency  $f$ :

Variate	5	6	7	8	9	10	11	12
Frequency	20	17	$f$	10	8	6	7	6

6. Calculate the mean of the following distribution using step deviation methods:

Marks	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	10	9	25	30	16	10

7. The upper part of a tree broken by wind, falls to the ground without being detached. The top of the broken part touches the ground at an angle of  $38^\circ 30'$  at a point 6m from the foot of the tree. Calculate:

(i) The height at which the tree is broken

(ii) the original height of the tree correct to two decimal places.

8. From a point P on the ground the angle of elevation of the top of a 10m tall building and a helicopter, hovering over the top of the building are 30degree and 60degree respectively. Find the height of the helicopter above the ground.

9. The angles of depression of the top and the bottom of a 8m tall building from the top of a multi- storeyed building are 30degree and 45degree respectively. Find the height of the multi- storeyed building and the distance between the two buildings, correct to two decimal places.

10. Prove the following identities:  $\sin\theta - \frac{2\sin^3\theta}{2\cos^3 - \cos\theta} = \tan\theta$ .

11. A sphere of diameter 12cm is dropped in a right circular cylindrical vessel, partly filled with water. If the sphere is completely submerged in water, the water level in the cylindrical vessel rises  $3\frac{5}{9}$  cm. find the diameter of the cylindrical vessel.

12. Metallic spheres of radii 6cm,8cm and 10cm, respectively are melted to form a single solid sphere. Find the radius of the resulting sphere.

13. The difference between the outer and the inner curved surface of a cylinder 14cm long is  $88\text{cm}^2$ . Find the outer and the inner radii of the cylinder, given that the volume of the metal is  $176\text{cm}^3$ .

15. Find the equation of a straight line passing through(-1,2) and whose slope is  $\frac{2}{5}$ .

16. Find the equation of a straight line whose inclination is 60degree and which passes through the point (0,-3).

17. How many terms of the A.P. -6,-11/2,-5,... make the sum -25?

18. Find the geometric progression whose 4<sup>th</sup> term is 54 and 7<sup>th</sup> term is 1458.

19. The sum of three numbers in A.P. is -3 and the product is 8. Find the numbers.

20. Vivek invests Rs.4500 in 8%, Rs,10 shares at Rs,15. He sells the shares when the price rises to Rs. 30 and invests the proceeds in 12% Rs, 100 shares at Rs, 125. Calculate: (i) the sale proceeds (ii) the number of Rs,125 shares he buys.

(iii) the change in his annual income from dividend.