

# REGIONAL COACHING CENTRE

## Assignment for SA-1 Preparation(ASP)

Class X

Sub: Math

Due on ..../...../.....

1. Prove that  $\sqrt{3}$  is a irrational no.
2. Show that  $\sqrt{2} + \sqrt{3}$  is irrational.
3. Draw the graph of the polynomial  $x^2 - 3x - 4$ . Read the zeros from the graph.
4. What are the quotient and the remainder, when  $3x^4 + 5x^3 - 7x^2 + 2x + 2$  is divided by  $x^2 + 3x + 1$ ?
5. Find all zeros of  $x^4 - 3x^3 - 3x^2 + 6x - 2$  if you know that two of its zeros are  $\sqrt{2}$  and  $-\sqrt{2}$ .
6. Form the pair of linear equations in the following problems, and find their solutions graphically.
  - (i) 10 students of class X took part in mathematics quiz. If the number of girls is 4 more than the number of boys, find the number of boys and girls who took part in the quiz.
  - (ii) 5 pencils and 7 pens together cost is ₹50, whereas 7 pencils and 5 pens together cost ₹46. Find the cost of one pencil and a pen.
7. Ram is three times as old as Rahim. Five years later, Ram will be two and a half times as old as Rahim. How old are Ram and Rahim now?
8. A purse contains 25 paise coins in one-third of the number of 10 paise coins in the purse, find the total no of coins in the purse.
9. Ved travels 600 km by train and partly by car. He takes 8 Hours, if he travels 120 km by train and remaining distance by car, he takes 20 minutes longer. Find the speed of the train and the car respectively.
10. If a room were 2 metre longer and 3 metre broader its area would have been increased by 75 sq. m. If it were one metre shorter and 2 metre broader the area would have increased by 16 sq.m. find its length and breath.
11. the sum of the digits of a two digit number is 15. The number interchanging the digits exceeds the given number by 9. Find the number.
12. In a two digits number the unit's digit is twice the ten's digit. If 27 is added to the number, the digits interchange their places. Find the number.
13. A fraction reduces to  $\frac{1}{4}$  when 2 is subtracted from the numerator and 3 is added to the denominator. But it reduces to  $\frac{2}{3}$  if 6 is added to the numerator and denominator is multiplied by 3. Find the fraction. [Ans  $\frac{4}{5}$ ]
14. Ritu can row downstream 20 km in 2 hours, and upstream 4 km in 2 hours. Find her speed of rowing in still water and the speed of the current.[Ans 6Kmph, 4 Kmph]

15. 2 women and 5 men can together finish a piece of embroidery in 4 days, while 3 women and 6 men can finish it in 3 days. Find the time taken by 1 woman alone to finish the embroidery, and that taken by 1 man alone. [Ans 18 days, 36 days]
16. A man rowing at the rate of 5 km an hour in still water takes thrice as much time in going 40 km up the river as in going 40 km down. Find the rate at which the river flows. [Ans 2.5 Kmph]
17. Solve for u and v:  
 $\frac{15}{u} + \frac{2}{v} = 17, \frac{1}{u} + \frac{1}{v} = \frac{36}{5}$
18. A person invested some amount at the rate of 12% simple interest and the remaining at 10%. He received yearly interest of ₹130 but if he had interchanged the amounts invested, he would have received ₹4 more interest. How much money did he invest at different rates? [Ans ₹500, ₹200]
19. A train covered a certain distance at a uniform speed. If the train would have been 10 km/h faster, it would have taken 2 hours less than the scheduled time. And, if the train were slower by 10 km/h; it would have taken 3 hours more than the scheduled time. Find the uniform speed and distance covered by the train. [Ans 50 Kmph, 600 Km]
20. One says, "Give me hundred rupees friend ! I shall then become twice as rich as you". The other replies, " If you give me ten rupees. I shall be six times as rich as you." Tell me what is the amount of their(respective) capital. [Ans ₹40, ₹170]
21. If  $\sec\theta = \frac{5}{4}$ , verify that  $\frac{\tan\theta}{1+\tan^2\theta} = \frac{\sin\theta}{\sec\theta}$
22. If  $5\tan\theta = 4$ , evaluate  $\frac{5\sin\theta-3\cos\theta}{5\sin\theta+2\cos\theta}$
23. Prove that:  $\frac{\sin\theta+\cos\theta}{\sin\theta-\cos\theta} + \frac{\sin\theta-\cos\theta}{\sin\theta+\cos\theta} = \frac{2\sec^2\theta}{\tan^2\theta-1}$
24. Prove that  $(\operatorname{cosec}A - \sin A)(\sec A - \cos A) = \frac{1}{\tan A + \cot A}$
25. Prove that  $(\sin A + \sec A)^2 + (\cos A + \operatorname{cosec} A)^2 = (1 + \sec A \operatorname{cosec} A)^2$
26. Evaluate:  $\frac{\sin 60^\circ}{\cos^2 45^\circ + 5\cos 90^\circ - \cot 30^\circ}$
27. If  $\tan A = \cot B$ , prove that  $A + B = 90^\circ$ .
28. Without trigonometric table, evaluate the following:  $\frac{2\sin 68^\circ}{\cos 22^\circ} - \frac{2\cot 15^\circ}{5\tan 75^\circ} - \frac{3\tan 45^\circ \tan 20^\circ \tan 40^\circ \tan 50^\circ \tan 70^\circ}{5}$
29. If  $\sec\theta + \tan\theta = p$ , prove that  $\sin\theta = \frac{p^2-1}{p^2+1}$
30. If  $x = a\sin\theta$  and  $y = b\tan\theta$ , prove that  $(\frac{a^2}{x^2} - \frac{b^2}{y^2}) = 1$
31. Prove that:  $\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} + \sqrt{\frac{1-\sin\theta}{1+\sin\theta}} = 2\sec\theta$ .
32. Prove that:  $\frac{\cot A - \cos A}{\cot A + \cos A} = \frac{\operatorname{cosec} A - 1}{\operatorname{cosec} A + 1}$ .
33. Prove that:  $\frac{\sin\theta - \cos\theta + 1}{\sin\theta + \cos\theta - 1} = \frac{1}{\sec\theta - \tan\theta}$