Package for sure success in Mathematics

Sl.No	Name of the chapter	Marks
1.	Similar Triangles	6(2 + 4)
2.	Circles	3
3.	Constructions	5(2 + 3)
4.	Pail of linear equations in two variables	6(2+ 4)
5.	Statistics	6(3+3)
6.	Real Numbers	4(2 + 2)
7.	Polynomials	2
8.	Quadratic equations	4(2 + 2)
9.	Coordinate geometry	4 (2 + 2)
10.	Probability	2
11.	Introduction to trigonometry	3(1 + 2)
12.	Arithmetic progressions	2
13.	Writing formulae	3
	Total	50

1.TRIANGLES (2 + 4 = 6)

Two Marks:

1. In the given figure, if LM II CB and LN II CD, then prove that $\dfrac{AM}{AB} = \dfrac{AN}{DN}$
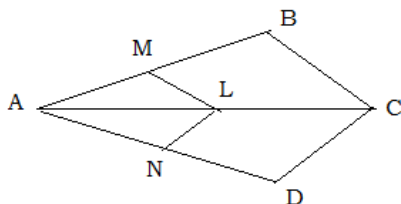
2. ABCD is trapezium in which AB II DC and its diagonals intersect at O. Show that $\dfrac{AO}{BO} = \dfrac{CO}{DO}$
3. A vertical pole of length 6 m casts a shadow 4 m longer on the ground and at the same time a tower cast a shadow 28 m long. Find the height of the tower.
4. ABC is an Isosceles triangle right angled at C. Prove that $AB^2 = 2AC^2$
5. A ladder 10 m long reaches a window 8 m above the ground. Find the distance of the foot of the ladder from the base of the wall.
6. Two poles of height 6 m and 11 m stand on a plane ground. If the distance between the feet of the poles is 12 m, find the distance between their tops.

4 Marks: Theorem

7. State and prove Thales theorem.
8. If in two triangles, corresponding angles are equal, then their corresponding sides are in the same ratio and hence the two triangles are similar. Prove.
9. If one angle of a triangle is equal to one angle of the other triangle and sides including these angles are proportional, then two triangles are similar. Prove.
10 The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides. Prove
11 State and prove Pythagoras Theorem.

2. Circles –Theorem-3 Marks

12. The length of tangents drawn from an external point to a circle are equal. Prove.
13. The tangent at any point of a circle is perpendicular to the radius through the point of contact.

3. Constructions(2 + 3 = 5)

2 Marks:

14. Draw a line segment of length 8 cm and divide it in the ratio 3 : 5
15. Draw a pair of tangents to a circle of radius 4 cm from a point which is 9 cm away from the centre of the circle. Measure the length of the tangents.
16. Draw a pair of tangents to a circle of radius 4.5 cm from a point which is 4 cm away from the circle.
17. Draw a pair of tangents to a circle of radius 5 cm such that angle between the radii is 100^0.
18. Draw a pair of tangents to a circle of radius 4cm such that angle between the tangents is 80^0.

3 Marks:

19. Construct a triangle of sides 4cm, 5 cm, and 6 cm and then a triangle similar to it whose

sides are $\frac{3}{5}$ of the corresponding sides of the first triangle.

20. Construct a triangle of sides 5cm, 6 cm, and 7 cm and then a triangle similar to it whose sides are $\frac{5}{3}$ of the corresponding sides of the first triangle.

21. Construct a triangle ABC with side BC= 6 cm,AB= 5 cm and angle ABC= 60^0. Then construct a triangle whose sides are $\frac{3}{5}$ of the corresponding sides of the Δ ABC.

4.Pair of linear equations in two variables(2 + 4= 6)
2 Marks:

22. 5 pencils and 7 pens together cost rs. 50 whereas 7 pencils and 5 pens together cost Rs.46. Find the cost of one pencil and that of one pen.(Any method)
23. Without drawing the graph, show that lines representing the equations 6x -3y + 10 =0 and 2x −y + 9 = 0 are parallel to each other.
24. Solve: i) x + y = 5 and x − y = 7   ii) x + y = 5 and 2x − 3y = 4
25. Five years ago, Maruthi was thrice as old as Sonu. Ten years later, Maruthi will be twice as old as Sonu. How old are Maruthi and Sonu?
26. Solve 2x + 3y = 11 and 2x − 4y= - 24 and hence find the value of m for which   y = mx + c.

4 Marks:

27. Solve graphically: x + y = 14 and x − y =4
28. Solve graphically: 2x + y = 6 and 4x − 2y =4
29. Solve graphically: 2x − y = 2 and 4x − y =4
30. Solve graphically: 3x + 2y = 13 and 4x − 3y = 6

5.Statistics(3 + 3=6) or (1 + 2 + 3)

31. The daily expenditure on food of 25 households are given below. Calculate the mean daily expenditure.   (2 Marks) (Any suitable method)

Daily expenditure in Rs.	100 - 150	150-200	200 − 250	250-300	300 - 350
Number of households	4	5	12	2	2

32. Ages of the patients admitted to a hospital during a year is given below. Calculate the mode for the data given.(2 Marks)

Age(in years	5 − 15	15 -25	25 -35	35 45	45 =55	55 -65
No. of patients	6	11	21	23	14	5

33. Marks obtained by 60 students, out of 50 in a mathematic examination are given below. Calculate the median for the data given.(3 Marks)

Marks	0 - 10	10 -20	20 − 30	30 -40	40 -50
No.of Students	5	12	18	15	10

34. Draw the ogive for the following data. (3Marks)

Daily Income	100-120	120-140	140-160	160-180	180-200
No.Of workers	12	14	8	6	10

35. During the medical check −up of 35 students of a class, their recorded as follow. Draw OGIVE for the given data.(3 Marks each)

Weight (in Kg)		38	40	42	44	46	48	50	42

Number of students	0	3	5	9	14	28	32	35

Draw Ogive for the above distribution by considering cumulative frequency
i) Less than type and ii) More than type.

6.Real Numbers(2 + 2=4)

36. Find the H.C.F of 135 and 345 using Euclid's Division algorithm.
37. Find the H.C.F of 336 and 68 by prime factor method.
38. Find the H.C.F and L.C.M of 28 and 126 by prime factor method.
39. Prove that $\sqrt{2}$, $\sqrt{3}$,……. are irrational numbers.(Only one will be given)
40. Prove that $5\sqrt{3}$ is an irrational number.
41. prove that $\sqrt{3}+2$, $\sqrt{3}-2$, $5-\sqrt{3}$, $\sqrt{3}+\sqrt{2}$ are irrational numbers.(Only one will be given)
42. Without performing long division, show that $\dfrac{13}{3125}$ is a terminating decimal. Also write the decimal expansion .

7. Polynomials(2 Marks)

43. Find the sum and product of zeros of the polynomial $6x^2 - 3 - 7x$.
44. Find the quadratic polynomial whose sum and product of its zeros respectively are i) 3 and 8   ii) 1/4, -2 iii) 2 and − 4
45. Divide $p(x)= x^3 - 3x^2 +5x - 3$ by $g(x)= x^2 - 2$ and find the quotient and remainder.
46. Check whether $g(x) = x^2 + 3x + 1$ is a factor of $p(x) = 3x^4 + 5x^3 - 7x^2 + 2x + 2$.

8.   Quadratic equations(2 + 2 = 4)

47. Find the two consecutive positive integers, sum of whose squares is 365.
48. The altitude of a right angled triangle is 7 cm less than its base. If the hypotenuse is 13 cm, find the other two sides.
49. Find the roots of the following quadratic equations by completing the square method.   i) $2x^2 - 7x + 3=0$ ii) $2x^2 + 6x - 9=0$ ii) $x^2 = 3x + 6$
50. Find the roots of the following quadratic equations using formula.

   i) $2x^2 +5x + 3= 0$ ii) $x^2 - 7x =5$ iii) $x + \dfrac{1}{x} = 3$

51. Find the nature of the roots of the equation $2x^2 - 6x + 3 = 0$.
52. Find the value of K for which the following equations have equal roots.
   i) $2x^2 + kx +3 = 0$ ii) $x^2 -kx + 9= 0$ ii) $kx^2 - 12 x +9 = 0$
53. The product of two consecutive positive odd integers is 195. Find the numbers.

9. Coordinate Geometry(2 + 2 = 4)

54. Find the distance between the points (- 5, 7) and (- 1, 3)
55. Find the distance between the origin and a point (8, 6).
56. Find the point on x-axis which is equidistance from (2, - 5) and (-2, 9)
57. Find the value of y for which the distance between the points P(2,-3) and Q(10, y).
58. Find the coordinates of the point which divides the line joining the points (3, -2) (5, 6) in the ration 3 : 2.
59. Find the ratio in which the line segment joining the points (-3, 10), (6, - 8) is divided by (-1, 6).
60. Show that the points (3, 2), (-2, - 3) and (2, 3) form a scalene triangle.

61. Find the centre of the circle passing through the points (6 ,-6), (3, - 7) and (3, 3).
62. Find the area of the triangle whose vertices are (-5,-1), 93, -5) and (5, 2)
63. Find the value of k if the points (8,1),)k,-4) and (2,5) are collinear.

10.Probability(1 + 2=3)

64. A coin is tossed repeatedly thrice. What is the probability that the same face appears all the three times?
65. A coin is tossed repeatedly twice. What is the probability that the same face does not appear both the times.
66. A die is thrown twice. What is the probability that
    i) Square numbers come up either time   ii) 5 will come up at least once.
    iii) sum of numbers appear is 10   iv) product of numbers appear is 12
67. A bag contains 3 red balls and 5 black balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is i) red ii) not red?
68. A box contain 50 discs which are numbered from 1 to 50. If one disc is drawn at random from the box, find the probability that it bears
    i) a square number   ii) A cube number
    iii) a number divisible by three   iv) a two digit number.

11. Introduction to Trigonometry(1 + 2=3)

69. If $\tan A = \dfrac{3}{4}$, find the trigonometric ratios of the angle A.

70. If $\cot \theta = \dfrac{7}{8}$, find the value of $\dfrac{(1+\sin\theta)(1-\sin\theta)}{(1+\cos\theta)(1-\cos\theta)}$

71. If $\tan 2A = \cot(A - 18^0)$, where 2A s an acute angle, find the value of A.
72. If $\sec 4A = \csc(A - 20^0)$, where 2A s an acute angle, find the value of A.

12.Arithmetic progression(2 + 4=6)or (1 + 1+4)

73. Which term of the AP : 3,8,13,18,……… is 78?
74. Which term of the AP : 2,4,6,8,………… is 126?
75. How many two digit numbers are divisible by 3?
76. Find the 20th term from the last term of the AP: 3,8,13,………253.
77. Find the sum of first 25 terms of the AP: 2,5,8,…………..
78. Find the sum of first 30 multiples of 5.
79. Find the three numbers in AP whose sum is 15 and their product is 105.
80. Find the four terms of the AP whose sum is 20 and product of the extremes is 16.