INTERNATIONAL INDIAN SCHOOL DAMMAM

CLASS-10 **MATHS WORKSHEET** **S.A-1** 2014-15 (B.S.S)

CHAPTER 1 .Real numbers

1. If $\frac{p}{q}$ is a rational number $(q \neq 0)$. What is the condition on q so that the decimal representation of $\frac{p}{q}$ is terminating?
2. Write a rational number between $\sqrt{2}$ *and* $\sqrt{3}$.
3. The decimal expansion of the rational no. $\frac{43}{2^4 .5^3}$ *will terminate after how many of decimals?*
4. Find the $(HCF\ X\ LCM)$ *for the numbers* 100 *and* 190.
5. State whether the number $(\sqrt{2}-\sqrt{3})(\sqrt{2}+\sqrt{3})$ *is* rational or irrational justify.
6. Write one rational and one irrational number lying between 0.25 and 0.32.
7. Express 107 in the form of 4q + 3 for some positive integer.
8. Write whether the rational number $\frac{51}{1500}$ will have a terminating decimal expansion or a non terminating repeating decimal expansion..
9. Use Euclid's division algorithm to find the HCF of 1288 and 575.
10. Check whether $5\ X\ 3\ X\ 11 + 11$ *and* $5\ X\ 7 + 7\ X\ 3 + 3$ are composite number and justify.
11. Check whether 6^n can end with the digit 0, where n is any natural number.
12. Given that LCM (26, 169) = 338, write HCF (26, 169).
13. Find the HCF and LCM of 6, 72 and 120 using the prime factorization method.
14. Show that $\sqrt{3}$ is an irrational number.
15. Show that $5 + 3\sqrt{2}$ is an irrational number.
16. Show that square of an odd positive integer is of the form 8m + 1, for some integer m.
17. Find the LCM & HCF of 26 and 91 and verify that $LCM\ X\ HCF = product\ of\ the\ two\ numbers.$
18. .State the fundamental theorem of Arithmetic.
19. Express 2658 as a product of its prime factors.
20. Show that the square of an odd positive integers is of the form 8m + 1 for some whole number m.
21. .Find the LCM and HCF of 17, 23 and 29.

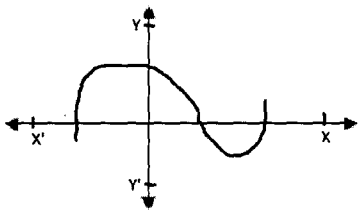
22 .Prove that $\sqrt{2}$ is not a rational number.

23.Find the largest positive integer that will divide 122, 150 and 115 leaving remainder 5, 7 and 11 respectively.

24.Using prime factorization method, find the HCF and LCM of 72, 126 and 168. Also show that $HCF\ X\ LCM \neq product\ of\ the\ three\ numbers.$

CHAPTER-2 Polynomials

1. In a graph of $y = p(x), find\ the\ number\ of\ zeroes\ of\ p(x)$.



2. If α, β are the zeroes of $f(x) = x^2 + x + 1$, then find $\frac{1}{\alpha} + \frac{1}{\beta}$.
3. Find a quadratic polynomial whose zeroes are $\frac{-2}{\sqrt{3}}$ and $\frac{\sqrt{3}}{4}$.
4. If $p(x) = \frac{1}{3}x^2 - 5x + \frac{3}{2}$ then find its sum and product of zeroes.
5. If the sum of zeroes of a given polynomial $f(x) = x^3 - 3kx^2 - x + 30$ is 6. Find the value of K.
6. Find the zero of polynomial $3x + 4$.
7. Write the degree of zero polynomial.
8. Form a cubic polynomial with zeroes 3, 2 and -1.
9. Find the zeroes of the quadratic polynomial $6x^2 - 3 - 7x$ and verify the relationship between the zeroes and the coefficients.
10. For what value of k, (-4) is a zero of polynomial $x^2 - x - (2k + 2)$?
11. Give an example of polynomials $p(x), g(x), q(x) and\ r(x)\ which\ satisfy\ division\ algorithm\ and\ deg.p(x) = deg.g(x)$.
12. Find the zeroes of $4u^2 + 8u$.
13. Find a quadratic polynomial, whose the sum and product of its zeroes are $\frac{1}{4}, -1$.

14.Find the zeroes of polynomial $x^3 - 2x^2 - x + 2$

15. If the zeroes of the polynomial $x^3 - 3x^2 + x + 1$are $\alpha - \beta,\ \alpha,\ \alpha + \beta$. Find $\alpha\ and\ \beta$
16.Divide $f(x) = 6x^3 + 11x^2 - 39x - 65$ by $g(x) = x^2 - 1 + x$

17.Check whether the polynomial $t^2 - 3$ is a factor of polynomial $2t^4 + 3t^3 - 2t^2 - 9t - 12\ by\ applying\ the\ division\ algorithm.$

18.Obtain all zeroes of $f(x) = x^3 + 13x^2 + 32x + 20$

19.Obtain all other zeroes of $3x^4 + 6x^3 - 2x^2 - 10x - 5$, if two of its zeroes are $\sqrt{\frac{5}{3}}$ and $-\sqrt{\frac{5}{3}}$

20.On dividing $x^3 - 3x^2 + x + 2\ by$ a polynomial $g(x)$,the quotient and remainder were $x - 2$ and $-2x + 4$respectively, find $g(x)$.

21.Check whether $g(x) = 3x - 2$ is a factor of $p(x) = 3x^3 + x^2 - 20x + 12$.

22.Find quotient and remainder applying the division algorithm on dividing $p(x) = x^3 - 6x^2 + 2x - 4$ by $g(x) = x - 1$.

23.Find zeros of the polynomial $2x^2 - 8x + 6$

24.Find the quadratic polynomial whose sum and product of its zeros are $\frac{2}{3}$, $\frac{-1}{3}$ respectively.

25.Find the zeroes of polynomial $x^3 - 2x^2 - x + 2$

26.If one of the zeroes of the polynomial $2x^2 + px + 4 = 0$ *is* 2, find the other root, also find the value of p.

27. If α *and* β are the zeroes of the polynomial $kx^2 + 4x + 4$ show that $\alpha^2 + \beta^2 = 24$, find the value of k.

27. If α *and* β are the zeroes of the equation $6x^2 + x - 2 = 0$, *find* $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$

CHAPTER-3 Pair of linear equations in two variables

1. Find the value of 'a' so that the point(3,9) lies on the line represented by 2x-3y=5
2. Find the value of k so that the lines 2x – 3y = 9 and kx-9y =18 will be parallel.
3. Find the value of k for which x + 2y =5, 3x+ky+15=0 is inconsistent
4. Check whether given pair of lines is consistent or not 5x – 1 = 2y, $y = \frac{-1}{2} + \frac{5}{2}x$
5. Determine the value of 'a' if the system of linear equations 3x+2y -4 =0 and 9x – y – 3 = 0 will represent intersecting lines.
6. Write any one equation of the line which is parallel to $\sqrt{2}x - \sqrt{3}y = 5$
7. Find the point of intersection of line -3x + 7y =3 with x-axis
8. For what value of k the following pair has infinite number of solutions.

   (k-3)x + 3y = k

   k(x+y)=12
9. Write condition so that $a_1x + b_1y = c_1$ and $a_2x + b_2y = c_2$ have unique solution.
10. 5 pencils and 7pens 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.
11. Solve the equations:

    37x +43 y = 123

    43x +37y = 117
12. Find the fraction which becomes to 2/3 when the numerator is increased by 2 and equal to 4/7 when the denominator is increased by 4
13. Solve the equations: px + qy = p – q , qx – py = p + q
14. Solve the equation using the method of substitution:

$3x - 5y = -1$

$x - y = -1$

15.Solve the equations:

$$\frac{1}{2x} - \frac{1}{y} = -1$$

$\frac{1}{x} + \frac{1}{2y} = 8$ Where, $x \neq 0, y \neq 0$

16. Solve the equations by using the method of cross multiplication:

$x + y = 7$

$5x + 12y = 7$

17. A man has only 20 paisa coins and 25 paisa coins in his purse, If he has 50 coins in all totaling Rs. 11.25, how many coins of each kind does he have.

18. For what value of k, will the system of equations

$x + 2y = 5$

$3x + ky - 15 = 0$ has a unique solution.

19.Draw the graphs of the equations

$4x - y = 4$

$4x + y = 12$

Determine the vertices of the triangle formed by the lines representing these equations and the x-axis.

Shade the triangular region so formed

21.Solve Graphically

$x - y = -1$ and

$3x + 2y = 12$

Calculate the area bounded by these lines and the x- axis ,

22.Solve :- $\frac{10}{x+y} + \frac{2}{x-y} = 4$

$\frac{15}{x+y} + \frac{5}{x-y} = -2$

23.Ritu can row downstream 20 km in 2 hr , and upstream 4 km in 2 hr . find her speed of rowing in still water and the speed of the current.

24.In a ΔABC , $\angle C = 3$, $\angle B = 2(\angle A + \angle B)$ find the these angle.

25. 8 men and 12 boys can finish a piece of work in 10 days while 6 men and 8 boys can finish it in 14 days. Find the time taken by 1 man alone and that by one boy alone to finish the work .

26.Find the value of K for which the system of linear equations $2x+5y = 3$, $(k+1)x + 2(k+2)y = 2K$ Will have infinite number of solutions.

27.Solve for x and y:

$x + y = a + b$

$ax - by = a^2 - b^2$

28.For what value of k will the equation $x+5y-7=0$ and $4x+20y+k=0$ represent coincident lines?

29.Solve graphically: $3x+y+1=0$

$2x-3y+8=0$

30.The sum of digits of a two digit number is 9. If 27is subtracted from the number, the digits are reversed. Find the number.

31.Draw the graph of $x + 2y - 7 = 0$ and $2x - y - 4 = 0$. Shade the area bounded by these lines and Y-axis.

32.Students of a class are made to stand in rows. If one student is extra in a row, there would be 2 rows less. If one student is less in a row there would be 3 rows more. Find the number of the students in the class.

33.A man travels 370 km partly by train and partly by car. If he covers 250 km by train and the rest by the car it takes him 4 hours, but if he travels 130 km by train and the rest by car, he takes 18 minutes longer. Find the speed of the train and that of the car

34.Given linear equation $2x+3y-8=0$, write another linear equation such that the geometrical representation of the pair so formed is (i) intersecting lines, (ii) Parallel Lines.

CHAPTER-4 TRIANGLES

1. If in two triangles, corresponding angles are equal, then the two triangles are.....

2. ΔABC is a right angled at B. BD is perpendicular upon AC. If AD=a, CD=b, then AB^2=

3. The area of two similar triangles are $32cm^2$ and $48cm^2$.If the square of a side of the first Δ is $24cm^2$,then the square of the corresponding side of 2^{nd}*triangle* will be

4. ABC is a triangle with DE|| BC. If AD=2cm, BD=4cm then find the value DE:BC

5. In ΔABC,DE ||BC, if AD=4x-3,DB=3x-1,AE=8x-7and BC=5x-3,then find the values of x are:

6. The perimeters of two similar triangles are 40cm and 50 cm respectively, find the ratio of the area of the first triangle to the area of the 2^{nd} triangle:

7. A man goes 150m due east and then 200m due north. How far is he from the starting point?

8. A ladder reaches a window which is 12m above the ground on one side of the street. Keeping its foot at the same point, the ladder is turned to the other side of the street to reach a window 9m high. If the length of the ladder is 15m, find the width of the street.

9. BO and CO are respectively the bisector of ∠B and ∠C of ΔABC.AO produced meets BC at P,then find AB/AC

10.In ▲ABC,the bisectors of ∠B intersects the side AC at D.A line parallel to side AC intersects line segments AB,DB and CB at points P,R,Q respectively.Then, Find AB XCQ

11.If ΔABC is an equilateral triangle such that AD⊥BC,then AD^2=.....

12.If ΔABC and ΔDEF are similar triangles such that ∠A=47^0,and∠E=83^0 ,then find ∠C

13.Two isosceles triangles have equal angles and their areas are in the ratio 16:25,then find the ratio of their corresponding heights

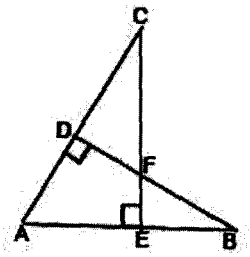
14.Two poles of heights 6m and 11m stand vertically upright on a plane ground.If the distance between their feet is 12m,then find the distance between their tops.

15.The lengths of the diagonals of a rhombus are 16cm and 12cm.Then, find the length of the side of the rhombus .

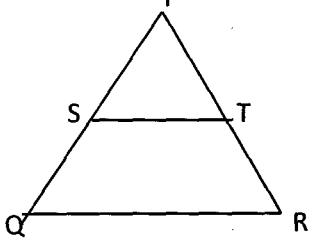
16..In given fig. BD⊥AC and CE⊥AB then prove that

(a)ΔAEC~ΔADB

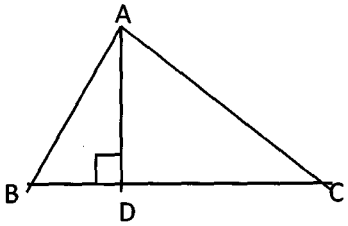
(b)CA/AB=CE/DB



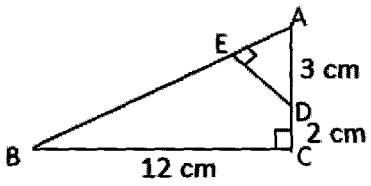
17. In the given figure fig .$\frac{PS}{SQ}=\frac{PT}{TR}$, and ∠PST=∠PQR. Prove that ΔPQR is an isosceles triangle.



18..In given fig AD⊥BC and ∠B<90^0,prove that $AC^2=AB^2+BC^2-2BC$ x BD

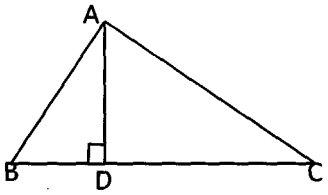


19.In given fig. ΔABC is right angled at C and DE⊥AB.Prove that ΔABC~ΔADE and hence find length of AE and DE.



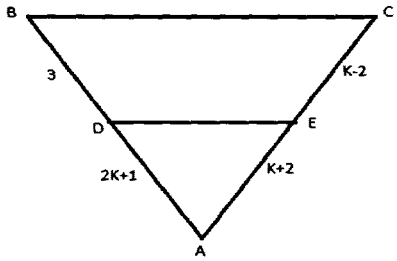
20. In a ΔABC,if DE||AC and DF||AE,prove that $\frac{EF}{BF}=\frac{EC}{BE}$

21.In given fig.AD⊥BC,if $\frac{BD}{AD}=\frac{DA}{DC}$,prove that ABC is a right angled triangle.



22.Two Δs ABC and DEF are similar. If ar(ΔDEF)=243cm^2,ar(ΔABC)=108cm^2 and BC=6cm,find EF.

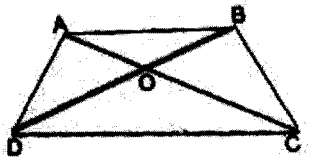
23.What is the value of K in given figure if DE||BC.



24. A pole of length 10m casts a shadow 2m long on the ground. At the same time a tower casts a shadow of length 60m on the ground then find the height of the tower.

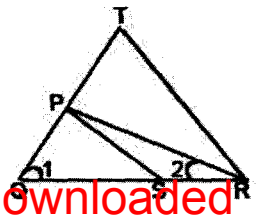
25.In given figure,AB||DCand $\frac{AO}{OC}=\frac{BO}{OD}$ then find the value of x, if .

$OA = 2x + 7, OB = 4x, OD = 4x - 4 \text{ and } OC = 2x + 4$



25..PQR is a right angled triangle with ∠P=90^0. If PM ⊥QR, then show that $PM^2 = QM\ X\ MR$

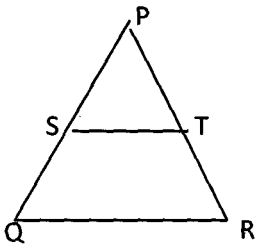
26. In given fig. $\frac{QR}{QS}=\frac{QT}{PR}$ and ∠1=∠2.Show that ΔPQS~ΔTQR.



27. Find the length of altitude of an equilateral triangle of side 2cm.

28. In a trapezium ABCD,O is the point of intersection of AC and BD,AB||CD and AB=2CD.If the area of $\Delta AOB=84cm^2$ then find area of ΔCOD.

29.In given fig. $\frac{PS}{SQ}=\frac{PT}{TR}=3$.If area of ΔPQR is $32cm^2$, then find the area of the quad.STQR



30. M is the mid-point of the side CD of a ||gmABCD.The line BM is drawn intersecting AC at L and AD produced at E.Prove that EL=2BL.

31.Prove that the ratio of the area of two similar Δs is equal to the square of the ratio of their corresponding medians.

32.. D and E are points on the sides CA and CB respectively of ΔABC, right angled at C.Prove that $AE^2+BD^2=AB^2+DE^2$.

33. .ABC and DBC are two Δs on the same base BC and on the same side of BC with $\angle A=\angle D=90^0$.If CA and BD meet each other at E,show that AE x EC=BE x ED.

34.Prove that in a right angled triangle the square of hypotenuse is equal to the sum of the squares of the other two sides.

CHAPTER- 5 **TRIGONOMETRY**

1.If θ and 3θ-30° are acute angles such that sinθ=cos(3θ-30°),then find the value of tanθ.

2Find the value of $\frac{(cos30°+sin60°)}{(1+cos60°+sin30°)}$

3. Find the value of $(\sin\theta+\cos\theta)^2+(\cos\theta-\sin\theta)^2$

4. If $\tan\theta=\frac{3}{4}$ then find the value of $\cos^2\theta-\sin^2\theta$

5. If secθ+tanθ=p, then find the value of secθ-tanθ

6. change $\sec^4\theta-\sec^2\theta$ in terms of tanθ.

7. If cotθ=1/√3 then find the value of $(1-\cos^2\theta)/(1+\cos^2\theta)$

8. If $cot\theta+\frac{1}{cot\theta}=2$ then find the value of $cot^2\theta+\frac{1}{cot^2\theta}$.

9. Ifsinθ=a/b,then find the value ofsecθ+tanθ

10. Ifcos x=cos60° cos30°+sin60° sin30°,then find the value of x

11. If 0°≤ x ≤90° and $2\sin^2x=1/2$,then find the value of x

12. Find the value of $\text{cosec}^2 30°-\sin^2 45°-\sec^2 60°$

13. Simplify (secθ+tanθ)(1-sinθ)

14. If secα=5/4 then evaluate $\tan\alpha/(1+\tan^2\alpha)$.

15. If A+B =90°,then prove that $\sqrt{\frac{tanA\,tanB+tanA\,cotB}{sinA\,secB}-\frac{sin^2B}{cos^2B}}$ = tanA

16. Prove that cosA/(1-sinA)+cosA/(1+sinA) =2secA.

17. Prove that $\sqrt{\frac{secA-1}{secA+1}}+\sqrt{\frac{secA+1}{secA-1}}$ = 2cosecA

18. Prove that $(\sin\theta+\text{cosec}\theta)^2+(\cos\theta+\sec\theta)^2=7+\tan^2\theta+\cot^2\theta$.

19. Evalute $\frac{11\sin70°}{7\cos20°}-\frac{4\cos53°\,\text{cosec}37°}{7\tan15°\tan35°\tan55°\tan75°}$

20. Prove that $\sqrt{\frac{cosecA-1}{cosecA+1}}+\sqrt{\frac{cosecA+1}{cosecA-1}}$ = 2secA.

21. In a right angle triangle ABC,right angled at B, if tanA=1, then verify that 2sinA cosA = 1.

22. If tan (A-B)=√3, and sinA =1, then find A and B.

23. If θ is an acute angle and $\sin\theta=\cos\theta$, find the value of $3\tan^2\theta + 2\sin^2\theta - 1$.

24. If $\frac{x}{a}\cos\theta + \frac{y}{b}\sin\theta = 1$ and $\frac{x}{a}\sin\theta - \frac{y}{b}\cos\theta = 1$, prove that $x^2/a^2 + y^2/b^2 = 2$.

25. Evaluate the following :- $\sin^2 25° + \sin^2 65° + \sqrt{3}(\tan 5° \tan 15° \tan 30° \tan 75° \tan 85°)$.

26. If $\frac{\cos\alpha}{\cos\beta} = m$, and $\frac{\cos\alpha}{\sin\beta} = n$, show that $(m^2+n^2)\cos^2\beta = n^2$.

27. Prove that $\tan^2\theta + \cot^2\theta + 2 = \operatorname{cosec}^2\theta \sec^2\theta$.

28. Prove that $(\tan A - \tan B)^2 + (1+\tan A \tan B)^2 = \sec^2 A \sec^2 B$.

29. If $(\cos\theta-\sin\theta) = \sqrt{2}\sin\theta$, then show that $\cos\theta + \sin\theta = \sqrt{2}\cos\theta$.

30. Prove that $(\sin\theta+\sec\theta)^2 + (\cos\theta + \operatorname{cosec}\theta)^2 = (1+\sec\theta \operatorname{cosec}\theta)^2$.

31. Prove that $\frac{\sin\theta}{1-\cos\theta} + \frac{\tan\theta}{1+\cos\theta} = \sec\theta\operatorname{cosec}\theta + \cot\theta$

32. Prove that $(\sin\theta - \operatorname{cosec}\theta)(\cos\theta - \sec\theta) = \frac{1}{\tan\theta+\cot\theta}$.

33. If $\cot\theta = \frac{15}{8}$, evaluate $(2 + 2\sin\theta)(1 - \sin\theta)/(1+\cos\theta)(2 - 2\sin\theta)$.

CHAPTER - 6 **STATISTICS**

1	What is the mean of 1st ten prime numbers ?
2	What measure of central tendency is represented by the abscissa of the point where less than ogive and more than ogive intersect?
3	If the mode of a data is 45 and mean is 27, then median is _____.
4	Find the mode of the following

X_i	35	38	40	42	44	
f_i	5	9	10	7	2	

5 Write the median class of the following distribution.

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	4	4	8	10	12	8	4

6 Calculate the mean of the following distribution

Class interval	50-60	60-70	70-80	80-90	90-100
Frequency	8	6	12	11	13

7 Find the mode of the following frequency distribution

Marks	10-20	20-30	30-40	40-50	50-60
No. of students	12	35	45	25	13

8 Find the median of the following distribution

Class interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	5	8	20	15	7	5

9 A class teacher has the following absentee record of 40 students of a class for the whole term.

No. of days	0-6	6-10	10-14	14-20	20-28	28-38	38-40
No. of students	11	10	7	4	4	3	1

Write the above distribution as less than type cumulative frequency distribution.

10 If the mean distribution is 25

Class	0-10	10-20	20-30	30-40	40-50
Frequency	5	18	15	P	6

Then find p.

11 Find the mean of the following frequency distribution using step deviation method

Class	0-10	10-20	20-30	30-40	40-50
Frequency	7	12	13	10	8

12 Find the value of p if the median of the following frequency distribution is 50

Class	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Frequency	25	15	P	6	24	12	8

13 Find the median of the following data

Marks	Less Than 10	Less Than 30	Less Than 50	Less Than 70	Less Than 90	Less Than 110	Less Than 130	Less than 150
Frequency	0	10	25	43	65	87	96	100

14 The mean of the following frequency distribution is 57.6 and the sum of the observations is 50. Find the missing frequencies f1 and f2.

Class	0-20	20-40	40-60	60-80	80-100	100-120	Total
Frequency	7	f_1	12	f_2	8	5	50

15 The following distribution give the daily income of 65 workers of a factory

Daily income (in Rs)	100-120	120-140	140-160	160-180	180-200
No. of workers	14	16	10	16	9

Convert the above to a more than type cumulative frequency distribution and draw its ogive.

16 Draw a less than type and more than type ogives for the following distribution on the same graph. Also find the median from the graph.

Marks	30-39	40-49	50-59	60-69	70-79	80-89	90-99
No. of students	14	6	10	20	30	8	12

(By- Minimol Sam B.S.S)