INTERNATIONAL INDIAN SCHOOL, DAMMAM

MATHEMATICS WORKSHEET – 2018-2019 CLASS 10

PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

1. Solve graphically the following system of equations. Shade the region bounded by these lines and y-axis. Find the area of the shaded region.

   $4x - 5y - 20 = 0,\ \ 3x + 5y - 15 = 0$

2. Solve the following system of linear equations graphically. Also, find the vertices of the triangle formed by these lines and x-axis.

   $3x - y + 9 = 0,\quad 3x + 4y - 6 = 0$

3. Solve the following system of equations using the method of substitution

   $6x + 5y = 11,\ \ 9x + 10y = 21$

4. Solve the following system of equations using the method of elimination

   $x + y = a + b,\quad ax - by = a^2 - b^2$

5. Solve the following system of equations using the method of cross-multiplication

   $3x + 2y = -25,\quad 2x + y = -10$

6. Solve the following system of equations

   a. $\frac{2x}{a} + \frac{y}{b} = 2$, $\frac{x}{a} - \frac{y}{b} = 4$

   b. $x + \frac{6}{y} = 6$, $3x - \frac{8}{y} = 5$

   c. $\frac{1}{5x} + \frac{1}{6y} = 12$, $\frac{1}{3x} - \frac{3}{7y} = 8$

   d. $\frac{x+y}{xy} = 2$, $\frac{x-y}{xy} = 6$

   e. $\frac{22}{x+y} + \frac{15}{x-y} = 5$, $\frac{55}{x+y} + \frac{45}{x-y} = 14$

   f. $\frac{1}{2(x+2y)} + \frac{5}{3(3x-2y)} = \frac{-3}{2}$, $\frac{5}{4(x+2y)} - \frac{3}{5(3x-2y)} = \frac{61}{60}$

7. Find the value of k for which the following system of equations has a unique solution.

   $10x + 3ky - 1 = 0$

   $5x + 3y - 2 = 0$

8. Find the value of k for which the following system of equations have infinitely many solutions.

   $x + (k+1)y = 5$

   $(k+1)x + 9y = 8k - 1$

9. Find the value of k for which the following system of equations has no solution.

   $3x + y = 1$

   $(2k-1)x + (k-1)y = 2k + 1$

10. Find the values of a and b for which the following system of equations has infinitely many solutions

    $3x - (a+1)y = 2b - 1$

    $5x + (1-2a)y = 3b$

11. The present age of a father is three years more than three times the age of the son. Three years hence father's age will be 10 years more than twice the age of the son. Determine their present ages.
12. The sum of the digits of a two digit number is 12. The number obtained by reversing the order of the digits of the given number exceeds the given number by 18. Find the two digit number.
13. A two-digit number is such that the product of the digits is 20. If 9 is added to the number, the digits interchange their places. Find the number.
14. A sailor goes 8 km downstream in 40 minutes and returns in 1 hour. Determine the speed of the sailor in still water and the speed of the current.
15. A boat can go 20 km upstream and 30 km downstream in 3 hours. It can go 10 km upstream and 20 km downstream in $1\frac{2}{3}$ hours. Find the speed of the boat in still water and also the speed of the stream.
16. A train covered a certain distance at uniform speed. If the train would have been 6km/h faster, it would have taken 4 hours less than the scheduled time. Also if the train were slower by 6 km/h, it would have taken 6 hours more than the scheduled time. Find the length of the journey.
17. A part of the monthly expenditure of a family is constant and the remaining varies with the price of wheat. When the rate of wheat is Rs. 250 per quintal, the total monthly expenditure is Rs. 1,000 and when it is Rs. 240 per quintal, the total monthly expenditure of the family is Rs. 980. Find the total monthly expenditure of the family when the cost of wheat is Rs. 350 per quintal.
18. 8 women and 12 girls can finish a piece of work in 10 days, while 6 women and 8 girls can finish it in 14 days. Find the time taken by one woman alone and that by one girl alone to finish the same work.
19. It takes 12 hours to fill a swimming pool using two pipes. If the larger pipe is used for 4 hours and the smaller pipe for 9 hours, only half the pool is filled. How long would it take for each pipe alone to fill the pool?
20. Points A and B are 70 km apart on a highway. A car starts from A and another car starts from B at the same time. If they travel in the same direction, they meet in 7 hours, but if they travel towards each other they meet in one hour. What are their speeds?
21. In a school, there are only two sections of class X, A and B. If 10 students are sent from A to B, the number of students in each room is same. If 20 students are sent from B to A the number of students in A is double the number of students in B. Find the number of students in each room.
22. A takes 3 hours more than B to walk 30 km. But if A doubles his pace, he is ahead of B by $1\frac{1}{2}$ hours. Find their speeds of walking.
23. Students of a class are made to stand in a 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 students in the class.

INTERNATIONAL INDIAN SCHOOL DAMMAM

CLASS X MATHS WORKSHEET 2018-19
REAL NUMBERS

1 Using Euclid's Division Algorithm find the HCF of

a) 408 and170 b)455 and 75.

2 Prove that $\sqrt{2}$ is an irrational number.

3 Prove that $5+3\sqrt{3}$ is an irrational number.

4 Show that any positive odd integer is of the form 6q+1 , 6q+3 or 6q+5, where q is some integer.

4 Find the LCM and HCF of 18 and 48.

5 The HCF of two numbers is 145 and their LCM is 2175. If one number is 725, find the other number.

6 Show that the number 8^n can never end with the digit zero for any natural number n.

7 Explain whether 3x12x101 + 4 is a prime number or composite number.

8 Show that square of any positive integer is of the form 4m or 4m+1 for some integer m.

9 Find the smallest number which leaves remainder 8 and 12 when divided by 28 and 32 respectively.

10 Show that cube of any positive integer is of the form 9m, 9m+1 or 9m+8.

11 Without division, state whether the following rational numbers will have a terminating decimal expantion or non-terminating repeating decimal expansion.

a) 6/15 b) 77/210

MATHEMATICS - X

CHAPTER - 2 POLYNOMIALS

BSS 2018 -19

1. Find a quadratic polynomial, the sum and product of whose zeroes are 1 and -2 respectively.
2. Find the quadratic polynomial whose one zero is 5 & product of zeroes is 30.
3. Find the zeroes of the following quadratic polynomials and verify the relationships between the zeroes and the coefficients of the polynomials:- (a) $8x^2 - 19x - 15$; (b) $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$

   (c) $5\sqrt{5}y^2 + 20y + 3\sqrt{5}$
4. Find all the zeroes of the polynomial $x^4 + x^3 - 34x^2 - 4x + 120$, if two of its zeroes are 2 and (-2)
5. Find all the zeroes of the polynomial $x^3 + 3x^2 - 4x - 12$, if one of its zeroes is -3.
6. What must be subtracted from $8x^4 + 14x^3 + 2x^2 + 7x - 8$ so that the resulting polynomial is exactly divisible by $4x^2+3x-2$?
7. Find the value of p and q so that $x^4 + x^3 + 8x^2 + px + q$ is divisible by $x^2 + 1$
8. What are the quotient and the remainder , when $3x^4 + 5x^3 - 7x^2 + 2x + 2$ is divided by $x^2 + 3x^3 + 1$
9. If one root of the polynomial P(x) = $5x^2 + 13x + k$ is reciprocal of the other. Find the value of K.
10. On dividing $f(x) = 2x^3 - 5x^2 + 4x - 8$ by g(x), the quotient and the remainder are $(2x - 9)$ and $24x - 17$, respectively. Find g(x).
11. If α and β are the zeroes of the quadratic polynomial $P(x) = x^2+x-2$. Find the value of $\alpha^{-1} + \beta^{-1}$
12. If α and β are the zeroes of the quadratic polynomial $2x^2-3x-5$, form a polynomial whose zeroes are $2\alpha + 1$ and $2\beta + 1$

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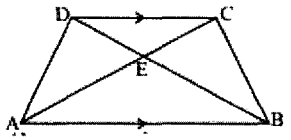
INTERNATIONAL INDIAN SCHOOL – DAMMAM

MATHEMATICS-CLASS X

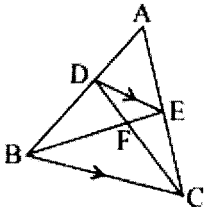
TRIANGLES

1. In ΔABC, DE || BC
   (a) IF AD /DB = 2/3 and AC = 18cm, find AE.
   (b) IF AD = x, DB = x – 2 , AE = x + 2, EC = x –1, find x.
   (c) If AD = 8cm, AB = 12cm, AE = 12cm, find CE.

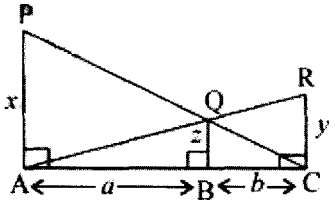
2. In the given figure, AB || DC. If EA = 3x – 19, EB = x – 4, EC = x – 3 and ED = 4, find x.



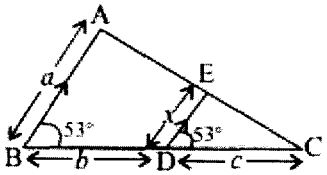
3. In the following figure, DE || BC and AD:DB = 5:4, find ar(ΔDFE)/ar(ΔCFB)



4. In the given figure, PA, QB and RC are perpendicular to AC. Show that $\frac{1}{x}+\frac{1}{y}=\frac{1}{z}$

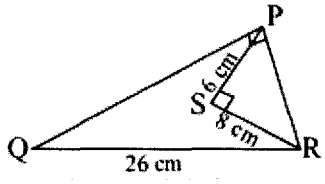


5. Two poles of height 'a' meters and 'b' meters are 'p' meters apart. Prove that height of the point of intersection of line joining top of each pole to foot of the opposite pole is $\frac{ab}{a+b}$ meters.
6. In the given figure, find x in terms of a, b and c.



7. In a right angle triangle ABC, right angled at C, P and Q are the points of the sides CA and CB respectively which divides these sides in the ratio 1:2, prove that $9(AQ^2 + BP^2) = 12\ AB^2$

8. In ΔPQR, $\angle QPR = 90°$ and QR = 26 cm. If PS $\perp$ SR, PS = 6 cm and SR = 8 cm, find ar(ΔPQR).

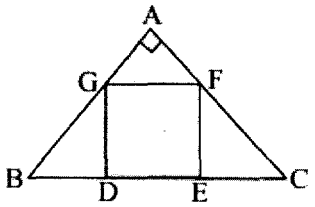


9. A ladder 25 m long reaches a window which is 24 m above the ground on side of the street. Keeping the foot at the same point, the ladder is turned to the other side of the street to reach a window 7 m high. Find the width of the street.

10. Equilateral triangles are drawn on the sides of a right angled triangle. Show that the area of the triangle on the hypotenuse is equal to the sum of the areas of triangles on the other two sides.

11. In the given figure, DEFG is a square and $\angle BAC = 90°$. Prove that :

(*i*) AGF ~ DBG (*ii*) AGF ~ EFC (*iii*) DBG ~ EFC (*iv*) $DE^2 = BD \times EC$



12. . In a right angled triangle ABC, $\angle A = 90°$ and AD $\perp$ BC.

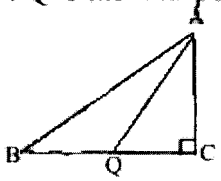
Prove that $AD^2 = BD \times CD$.

13. ABC is a right triangle, right-angled at C. Let BC = a, CA = b, AB = c and let p be the length of perpendicular from C on AB,

prove that: (i) $cp = ab$

(ii) $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$

14. In the given figure, $\angle BCA = 90°$. Q is the mid-point of BC. Prove that : $AB^2 = 4AQ^2 - 3AC^2$.



15. In ΔABC, AD is bisector of $\angle A$, meeting side BC at D.

(i) If AB = 10m, AC = 6cm, BC = 12cm find BD and DC.

(ii) If AB = 5.6cm, AC = 6cm and DC = 3cm, find BC.

INTERNATIONAL INDIAN SCHOOL – DAMMAM

MATHEMATICS-CLASS X INTRODUCTION TO TRIGONOMETRY

Q1. In ΔABC, right angled at B, if AB = 12 cm and BC = 5 cm, find (i) sin A and tan A (ii) sin C and c

Q2. Given $\cot\theta = \frac{20}{21}$ find all other trigonometric ratios.

Q3. If $\cos A = \frac{12}{13}$ verify that: $\sin A(1-\tan A) = \frac{35}{156}$.

Q4. (i) If $7\cot\theta = 24$, prove that $\sqrt{\frac{1-\cos\theta}{1+\cos\theta}} = \frac{1}{7}$ (ii) If $4\cot\theta = 5$, show that: $\frac{5\sin\theta + 3\cos\theta}{5\sin\theta - 2\cos\theta} = \frac{7}{2}$.

Q6. If $21\operatorname{cosec}\theta = 29$, find the value of : (*i*) $\frac{\cos^2\theta - \sin^2\theta}{1-2\sin^2\theta}$ (*ii*) $\frac{2\cos^2\theta - 1}{\cos^2\theta - \sin^2\theta}$

Q7. If $\tan\theta + \frac{1}{\tan\theta} = 2$; show that: $\tan^2\theta + \frac{1}{\tan^2\theta} = 2$.

Q8. Evaluate each of the following :

(i) $2\cos^2 60\cot 30° + 6\sin^2 30°\operatorname{cosec}^2 60°$ (ii) $\frac{5\sin^2 30° + \cos^2 45° - 4\tan^2 30°}{2\sin 30°\cos 30° + \tan 45°}$

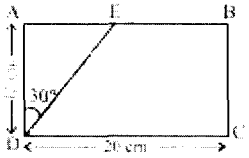
(iii) $2(\cos^2 45° + \tan^2 60°) - 6(\sin^2 45° - \tan^2 30°)$ (iv) $\frac{\tan^2 60° + 3\sec^2 30° + 4\cos^2 45° + 5\cos^2 90°}{\operatorname{cosec} 30° + \sec 60° - \cot^2 30°}$

Q9. If $\theta = 30°$, verify that : (i) $\sin 2\theta = \frac{2\tan\theta}{1+\tan^2\theta}$ (ii) $\cos 2\theta = \frac{1-\tan^2\theta}{1+\tan^2\theta}$ (iii) $\tan 2\theta = \frac{2\tan\theta}{1-\tan^2\theta}$

Q10. Given that $\sin(A+B) = \sin A\cos B + \cos A\sin B$, find the value of $\sin 75°$.

Q11. If $\sin(A+2B) = \frac{\sqrt{3}}{2}$ and $\cos(A+4B) = 0$, find the values of angles A and B.

Q12. ABCD is a rectangle with AD =12 cm and DC = 20 cm as shown. The line segment DE is dr making an angle of 30° with AD, intersecting AB in E. Find the lengths of DE and AE.



Q13. Evaluate each of the following:

(i) $\frac{\cos^2 20° + \cos^2 70°}{\sin^2 57° + \sin^2 33°}$ (ii) $\left(\frac{\sin 27°}{\cos 63°}\right)^2 + \left(\frac{\cos 63°}{\sin 27°}\right)^2$ (iii) $\cot 12°\cot 38°\cot 52°\cot 60$

Q14. Prove that:

(i) $\frac{\sin\theta.\cos(90°-\theta)\cos\theta}{\sin(90°-\theta)} + \frac{\cos\theta\sin(90°-\theta).\sin\theta}{\cos(90°-\theta)} = 1$ (ii) $\frac{\cos(90°-\theta).\sec(90°-\theta).\tan\theta}{\operatorname{cosec}(90°-\theta)\sin(90°-\theta).\cot(90°-\theta)} + \frac{\tan(9}{c}$

Q15. Without using trigonometric tables, find the value of each of the following:

(i) $\cos(40°+\theta) - \sin(50°-\theta) + \frac{\cos^2 40° + \cos^2 50°}{\sin^2 40° + \sin^2 50°}$

(ii) $\sec^2 10° - \cot^2 80° + \frac{\sin 15°\cos 75° + \cos 15°\sin 75°}{\cos\theta\sin(90°-\theta) - \sin\theta.\cos(90°-\theta)}$

(iii) $\frac{-\tan\theta\cot(90°-\theta) + \sec\theta\operatorname{cosec}(90°-\theta) + \sin^2 35° + \sin^2 55°}{\tan 10°\tan 20°\tan 45°\tan 70°\tan 80°}$

(iv) $\left(\frac{\tan 20°}{\operatorname{cosec} 70°}\right)^2 + \left(\frac{\cot 20°}{\sec 70°}\right)^2 + 2\tan 15°\tan 37°\tan 53°\tan 60°\tan 75°$

(v) $\frac{\sec 39°}{\operatorname{cosec} 51°} + \frac{2}{\sqrt{3}}.\tan 17°\tan 38°\tan 60°\tan 52°\tan 73° - 3(\sin^2 31° + \sin^2 59°)$

Q16. If $\sec 5\theta = \operatorname{cosec}(\theta - 36°)$, where 5θ is an acute angle, find the value of θ.

Q17. Simplify the following expressions:

(i) $(1 + \cos\theta)(\operatorname{cosec}\theta - \cot\theta)$ (ii) $\operatorname{cosec}\theta(1 + \cos\theta)(\operatorname{cosec}\theta - \cot\theta)$ (iii) $\dfrac{\sin^3\theta + \cos^3\theta}{\sin\theta + \cos\theta}$ (iv) $\dfrac{\sin^4 A}{\sin^2 A}$

Q18. Prove that following identities:

(i) $\operatorname{cosec}^2\theta + \sec^2\theta = \operatorname{cosec}^2\theta \cdot \sec^2\theta$ (ii) $2\sec^2\theta - \sec^4\theta - 2\operatorname{cosec}^2\theta + \operatorname{cosec}^4\theta = \cot^4$

(iii) $\dfrac{1+\tan^2\theta}{1+\cot^2\theta} = \left(\dfrac{1-\tan\theta}{1-\cot\theta}\right)^2$ (iv) $\dfrac{\tan\theta}{1-\cot\theta} + \dfrac{\cot\theta}{1-\tan\theta} = 1 + \tan\theta + \cot\theta = 1 + \sec\theta\operatorname{cosec}\theta$

(v) $\sqrt{\dfrac{1-\sin A}{1+\sin A}} = \dfrac{\cos A}{1+\sin A}$ (vi) $\sqrt{\dfrac{\sec\theta - 1}{\sec\theta + 1}} + \sqrt{\dfrac{\sec\theta + 1}{\sec\theta - 1}} = 2\operatorname{cosec}\theta$

(vii) $\dfrac{\sin\theta}{\cot\theta + \operatorname{cosec}\theta} = 2 + \dfrac{\sin\theta}{\cot\theta - \operatorname{cosec}\theta}$ (viii) $\left(1 + \dfrac{1}{\tan^2 A}\right)\left(1 + \dfrac{1}{\cot^2 A}\right) = \dfrac{1}{\sin^2 A - \sin^4 A}$

(ix) $\dfrac{\sin^2\theta}{1-\cot\theta} + \dfrac{\cos^3\theta}{\cos\theta - \sin\theta} = 1 + \sin\theta\cos\theta$ (x) $\dfrac{\cos^3\theta}{1-\tan\theta} + \dfrac{\sin^3\theta}{\sin\theta - \cos\theta} = 1 + \sin\theta\cos\theta$

(xi) $\dfrac{1 + \cos\theta - \sin^2\theta}{\sin\theta(1+\cos\theta)} = \cot\theta$ (xii) $\dfrac{1}{\operatorname{cosec} A - \cot A} - \dfrac{1}{\sin A} = \dfrac{1}{\sin A} - \dfrac{1}{\operatorname{cosec} A + \cot A}$

(xiii) $\tan^2 A - \tan^2 B = \dfrac{\cos^2 B - \cos^2 A}{\cos^2 B.\cos^2 A} = \dfrac{\sin^2 A - \sin^2 B}{\cos^2 A\cos^2 B}$ (xiv) $2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta)$

(xv) $\dfrac{\sin\theta - \sin\alpha}{\cos\theta + \cos\alpha} + \dfrac{\cos\theta - \cos\alpha}{\sin\theta + \sin\alpha} = 0$ (xvi) $\dfrac{\cot A + \operatorname{cosec} A - 1}{\cot A - \operatorname{cosec} A + 1} = \dfrac{1 + \cos A}{\sin A}$

Q19. If $\cos\theta + \sin\theta = \sqrt{2}\cos\theta$, show that $\cos\theta - \sin\theta = \sqrt{2}\sin\theta$

Q20. If $\sin\theta + \cos\theta = p$ and $\sec\theta + \operatorname{cosec}\theta = q$, show that $q(p^2 - 1) = 2p$.

Q21. If $x = a\sec\theta + b\tan\theta$ and $y = a\tan\theta + b\sec\theta$, prove that $x^2 - y^2 = a^2 - b^2$.

Q22.(i) If $\sec\theta = x + \dfrac{1}{4x}$, prove that $\sec\theta + \tan\theta = 2x$ or $\dfrac{1}{2x}$. (ii) If $\sec\theta + \tan\theta = p$, prove that $\dfrac{p^2}{p^2}$

Q23. If $\tan\theta + \sin\theta = m$ and $\tan\theta - \sin\theta = n$, prove that $m^2 - n^2 = 4\sqrt{mn}$.

Q24. If $\sin\theta + \sin^2\theta = 1$, prove that $\cos^2\theta + \cos^4\theta = 1$

Q25. If $3\sin\theta + 5\cos\theta = 5$, prove that $5\sin\theta - 3\cos\theta = \pm 3$.

Q26. If $x = a\sec\theta + b\tan\theta$ and $y = a\tan\theta + b\sec\theta$, prove that $x^2 - y^2 = a^2 - b^2$.

Q27. If $a\cos\theta = x$ and $b\cot\theta = y$, show that $\dfrac{a^2}{x^2} - \dfrac{b^2}{y^2} = 1$.

Q28. If $\dfrac{x}{a}\cos\theta + \dfrac{y}{b}\sin\theta = m$ and $\dfrac{x}{a}\sin\theta - \dfrac{y}{b}\cos\theta = n$, prove that $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = m^2 + n^2$.

MATHEMATICS

APPLICATION OF TRIGONOMETRY - CLASS x

1. A pole 6cm high casts a shadow 2√3m long on the ground, then find the sun's elevation? Ar
2. An observer 1.5m tall is 20.5 metres away from a tower 22m high. Determine the angle of ele of the top of the tower from the eye of the observer. Ans. 45°
3. A ladder 15m long just reaches the top of vertical wall. If the ladder makes an angle 60° with tl wall, find the height of the wall. Ans. 15/2 m
4. Find the angle of elevation of the sun's altitude when the height of the shadow of a vertical pc equal to its height: Ans. 45°
5. From a point 20m away from the foot of a tower ,the angle of elevation of top of the tower is 30°,find the height of the tower. Ans. 20/ √3 m
6. The shadow of a tower standing on a level plane is found to be 50m longer when sun's elevati 30° than when it is 60° . Find the height of the tower. Ans.25 √3m
7. From a window (9m above ground) of a house in a street, the angles of elevation and depressi the top and foot of another house on the opposite side of the street are 30° and 60° respectiv Find the height of the opposite house and width of the street. Ans.12m,3√ m]
8. From the top of a hill, the angle of depression of two consecutive kilometer stones due east ar found to be 300 and 450 . Find the height of the hill . Ans.1.37 km
9. Two poles of equal heights are standing opposite each other on either side of the road ,which 80m wide . From a point between them on the road the angles of elevation of the top of the p are 60◦ and 30◦. Find the heights of pole and the distance of the point from the poles. [Ans; h=34. 64m; 20m , 60m] .

10. The angle of elevation of a jet fighter from a point A on the ground is 60° . After a flight of 15 seconds, The angle of elevation changes to 30◦. If the jet is flying at a speed of 720km/ hr, find constant height at which the jet is flying. [Ans;1500m]
12. A boy , whose eye level is 1.3m from the ground , spots a ballon moving with the wind in a horizontal line at same height from the ground. The angle of elevation of the ballon from the e the boy at any instant is 60° . After 2 seconds , the angle of elevation reduces to 30° If the spe the wind at that moment is 29√3 m/s , then find the height of the ballon from the ground . [Ans; 88.3m)
13. A man on the deck on a ship 14m above water level , observes that the angle of elevation of tl of a cliff is 60° and the angle of depression of the base of the cliff is 30° . Calculate the distanc the cliff from the ship and the height of the cliff . [Ans ; h= 56m , distance 24.25m]
14. An aeroplane when flying at a height of 3125m from the ground passes vertically below anotl plane at an instant when the angle of elevation of the two planes from the same point on the ground are 30°and 60° respectively . Find the distance between the two planes at that instant [Ans ; 6250m]
15. The angle of elevation of a cloud from a point 60m above a lake is 30◦ and the angle of depres of the reflection of the cloud in the lake is 60° . Find the height of the cloud from the surface c lake. [Ans 120m]

    A vertical tower stands on a horizontal plane and is surmounted by a vertical flag staff of heig At a point on the plane , the angles of elevation of the bottom and the top of the flag staff are and β respectively. Prove that the height of the tower is

    $\frac{h \tan\alpha}{T\tan\beta - \tan\alpha}$

COORDINATE GEOMETRY

1. If A(6, –1), B(1, 3) and C(k, 8) are three points such that AB= BC, find the value of k.

2. Find all the possible value of a for which the distance between the points A(a, –1) and B(5, 3) is 5 units.

3. Determine, whether each of the given points (–2, 1), (2, –2) and (5, 2) are the vertices of right tri angle.

4. By distance formula, show that the points (1, –1), (5, 2) and (9, 5) are collinear.

5. Find a relation between x and y if the points (x, y), (1, 2) and (7, 0) are collinear

6. Find the point on x-axis which is equidistant from (–2, 5) and (2, –3).

7. Find a point on the y-axis which is equidistant from the points A(6, 5) and B(– 4, 3).

8. Prove that the points A(–3, 0), B(1, –3) and C(4, 1) are the vertices of an isosceles right-angled triangle. Find the area of this triangle.

9. If the distance of P(x, y) from A(5, 1) and B(–1, 5) are equal. Prove that 3x = 2y.

10. Show that the points A(1, 2), B(5, 4), C(3, 8) and D(–1, 6) are vertices of a square

11. Show that the points A(–4, –1), B(–2, –4), C(4, 0) and D(2, 3) are vertices of a rectangle. Also find its area.

12. Find the centre of a circle passing through the points (6, – 6), (3, – 7) and (3, 3).

13. If the points A(6, 1), B(8, 2), C(9, 4) and D(p, 3) are the vertices of a parallelogram, taken in order, find the value of p.

14. Find the coordinates of the points of trisection of the line segment joining the points (4, –1) and (–2, –3).

15. The coordinate of the midpoint of the line joining the point (3p, 4) and (–2, 2q) are (5, p). Find p and q .

16. The consecutive vertices of a parallelogram ABCD are A(1, 2), B(1, 0) and C(4, 0). Find the

fourth vertex D.

17. Find the ratio in which the point P(m, 6) divides the line segment joining the point A(–4, 3) and B(2, 8). Also find the value of m.

18. If three consecutive vertices of a parallelogram ABCD are A(1, –2), B(3, 6) and C(5, 10). Find the fourth vertex D.

19. Find the ratio in which the y-axis divides the line segment joining the points (5, – 6) and (–1, –4). Also find the point of intersection.

20. Find the ratio in which the line x – y – 2 = 0 divides the line segment joining the points A(3, –1) and B(8, 9).

21. The line joining the points A(2, 1) and B(5, –8) is trisected at the points P and Q. If the point P lies on the line 2x – y + k = 0, find the value of k.

22. If the points (10, 5), (8, 4) and (6, 6) are the midpoints of the sides of a triangle, find its vertices.

23. Find the centroid of a Δ ABC whose vertices are A(–1, 0), B(5, –2) and C(8, 2).

24. If A(–4, 5), B(0, 7), C(5, –5) and D(–4, –2) are the vertices of a quadrilateral, find the area of the quadrilateral ABCD.

25. Find the value of k if the points A(8, 1), B(k, –4) and C(2, –5) are collinear.

26. If the vertices of a triangle are (1, k), (4, –3) and (–9, 7) and its area is 15 sq. units, find the value(s) of k.

27.The base BC of an equilateral ΔABC lies on Y- axis. The co-ordinates of point C are (0, -3). If the origin is the midpoint of the base BC, find the co-ordinates of the points A and B.

28. If a is the length of one of the sides of an equilateral triangle ABC , base BC lies on X- axis and vertex b is at the origin, find the co-ordinates of the vertices of ΔABC.

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