INTERNATIONAL INDIAN SCHOOL, RIYADH

TERM - II

CLASS: X **SUBJECT: MATHEMATICS**

1. ARITHMETIC PROGRESSIONS

1) For what value of p, are 2p-1, 7 and 3p three consecutive terms of an A.P? (P=3)

2) If $\frac{1}{X+2}$, $\frac{1}{x+3}$ and $\frac{1}{x+5}$ are in A.P , find the value of x (1, -3)

3) How many two digit numbers are divisible by 7 (n = 13)

4) Find the number of integers between 50 and 500 which are divisible by 7 (64)

5) Find the 15^{th} term from the end of the A.P: 3, 5, 7,…….. ,201 (173)

6) Find the 11^{th} term from the end of the A.P: 10, 7, 4,……., - 62 (-32)

7) Find the middle term of A.P: 1, 8, 15, ……, 505 (253)

8) Which term of the sequence 114, 109, 104… is the first negative term? (24)

9) Which term of the sequence 121, 117, 113… is the first negative term? (32)

10) If the n^{th} term of the A.P. 9, 7, 5, …… is the same as the n^{th} term of the A.P. 15, 12, 9, ……., find n (n = 7)

11) If the 3^{rd} and 9^{th}term of an A.P. are 4 and -8 respectively, which term is zero (n = 5)

12) Determine the A.P whose 3^{rd} term is 16 and 7^{th} term exceeds the 5^{th} term by 12 (4, , 10, 16 …)

13) The 4^{th} term of an A.P is equal to 3 times the first term and the 7^{th} term exceeds twice the 3^{rd} term by 1. Find the A.P (3, 5 ,7, …)

14) The sum of 4th and 8th terms of an A.P is 24 and sum of 6^{th} and 10^{th} term is 44. Find A.P. (-13, -8, -3 ……..)

15) Find the A.P whose n^{th} term is 10 – 3n (7, 4, 1, ……..)

16) Determine the 2^{nd} term and n^{th} term of an A.P whose 6^{th} term is 12 and 8^{th} term is 22 (- 8, - 18 + 5n)

17) If 6 times the sixth term of an A.P is equal to 15 times the fifteenth term, find its 21^{st} term (0)

18) Which term of the A.P.? 3, 15, 27, 39, will be 120 more than its 21^{st} term (n = 31)

19) Show that progression 7, 2, -3, -8,…… Is an A.P. Find its n^{th} term (12 – 5n)

20) In the following A.P. find the missing term: *, 38, *, *, *, -22

21) For A.P. a_1, a_2, a_3… if $a_4/a_7 = 2/3$, find a_6/a_8 (4/5)

22) The angles of a triangle are in A.P, the last being half the greatest. Find the angles. (40˚, 60˚, 80˚)

23) The sum of 3 numbers in A.P is 3 and their product is -35. Find the numbers (7, 1, and -5)

24) If the 4^{th} term of an A.P is twice the 8^{th} term, prove that the 10^{th} term is twice the 11^{th} term

25) Find $a_{30} - a_{20}$ for the A.P : -9, -14, -19, -24, …… (- 50)

26) If the n^{th} term of an A.P is (5n – 2), find its first term and common difference

27) In an A.P, if the 6^{th} and 13^{th} terms are 35 and 70 respectively, find the sum of its first 20 terms.

28) In an A.P., if the sum of its 4^{th} and 10^{th} terms is 40, and sum of its 8^{th} and 16^{th} terms is 70, then find the sum of its First20 terms (S_{20} = 610)

29) In an A.P., the first term is 25, nth term is -17 and sum to first n terms is 60.Find n and d the common difference.

30) If Sn, the sum of first n terms of an A.P is given by $Sn = 3n^2 - 4n$, then find its nth term (6n – 7)

31) The sum of the first n terms of an A.P is $4n^2 + 2n$. Find the n^{th} term of this A.P. (8n – 2)

32) The sum of n terms of an A.P. is $3n^2 + 5n$. Find the A.P. Hence, find its 16^{th} term (6n + 2, 98)

33) Find the sum of n terms of an A.P whose n^{th} term is given by $t_n = 5 - 6n$ ($2n - 3n^2$)

34) Find the sum of all natural numbers less than 100 which are divisible by 6 (816)

35) Find the sum of 3 digit numbers which are not divisible by 7 (424214)

36) Find the sum of all the natural numbers upto 100, which are not divisible by 5 (4000)

37) Find the sum of all three digit numbers which leave the remainder 3 when divided by 5 (99090)

38) Find the sum of first seven multiples of 5 (140)

39) If 2 + 5 + 8 + ……+ x = 155, find x (n = 10, $x = a_{10=}29$)

40) Find the sum of the following A.P: 1 + 3 + 5 + …….. + 199. (10000)

41) Find the common difference of an AP whose first term is 100 and sum of first six terms is 5 times the the sum of the next 6 terms

42) Find the number of terms of the A.P, 63, 60, 57, …….. So that their sum is 693 (n = 22, 21)

43) How many terms of the sequence 18, 16, 14, ……, should be taken so that their sum is 0 (n= 19)

44) A sum of Rs 1400 is to be used to give 7 cash prizes to students of a school for their overall academic Performance if each prize is Rs40 less than the preceding price, find the value of each of the prizes. (320, 280, 240, 200, 160, 120, 80)

45) Find the sum of first 22 terms of an A.P. in which d = 7 and 22^{nd} term is 149 (1661)

46) Find the sum of the following A.P: 3, 9/2, 6, 15/2……. To 25 terms (525)

47) The ratio of the sum to p terms and q terms of an A.P. is $p^2 : q^2$. Prove that the common difference of the A.P.is twice the first term

48) An auditorium has 50rows with 20 seats in the first row, 22 in the second, 24 in the third and so fourth. How many seats are In the auditorium? (3450)

49) The sum of the first five terms of an A.P is 25 and the sum of of its next five terms is – 75. Find the 10^{th} term of the A .P (- 23)

50) The sum of the first 7 terms of an A.P. is 63 and the sum of its next 7 terms is 161. Find the 28^{th} term of this A.P (57)

51) If S_n denotes the sum of the first n terms of an A.P. , prove that $S_{30} = 3 (S_{20} – S_{10})$.

2. HEIGHTS AND DISTANCES

1. A 1.6 m tall girl stands at a distance of 3.2m from a lamp post and casts a shadow of 4.8 m on the ground. Find the height of The lamp post (2.60m)
2. A man standing on the deck of a ship, which is 10 m above water level, observes the angle of elevation of the top of a hill is 60˚ and the angle of depression of the base of the hill is 30.˚ Calculate the distance of the hill from the ship and the height of the hill (10√3m, 40m)
3. The angle of elevation of a cloud from a point 60m above a lake is 30˚ and angle of depression of the reflection of cloud in the Lake is 60˚. Find the height of the cloud. (120 m)
4. The angle of elevation of a jet plane from a point A on the ground is 60˚. After a flight of 15 sec the angle of elevation changes to 30˚. If the jet plane is flying at a constant height of 1500√3m, then find the speed of jet plane. (720 km /hr)
5. A vertical tower stands on a horizontal plane and is surmounted by a vertical flagstaff of height h. At a point on the plane, the angles of elevation at the bottom and the top of the flagstaff are α and β respectively. Prove that the height of the tower is $h \tan\alpha / \tan\beta - \tan\alpha$
6. The angle of elevation of the top of a tower from two points at distances a and b metres from the base and in the same straight line with it are complementary. Prove that height of the tower is $\sqrt{ab}$ metres.
7. The angles of elevation of the top of a rock from the top and foot of a 100 m high tower are 30˚ and 45˚respectively. Find the height of the rock. (236.5 m)
8. A boy is standing on the ground and is flying a kite with 100m of string at an elevation of 30˚ Another boy is standing on the roof of a 10m high building and is flying his kite at an elevation of 45˚. Both the boys are on opposite sides of the kite's .Find the length of the string that the Second boy must have so that two kites meet. (40√2m)
9. the shadow of a tower standing on a level ground is found to be 40 m longer when the sun′ s altitude is 30˚ than when it is 60˚. Find the height of the tower. (20√3m)
10. The angle of elevation ø of a vertical tower from a point on ground is such that its tangent is 5/12. On walking 192m towards The tpwer in the same straight line, the tangent of the angle of elevation Is found to be ¾. Find the height of the tower (180 m)
11. A bird is sitting on the top of a tree, which is 80m high. The angle of elevation of the bird, from a point on the ground is 45˚. The bird flies away from the point of observation horizontally and remains at a Constant height. After 2 sec, the angle of Elevation of the bird from the point of observation becomes 30˚. Find the speed of flying of the bird (29.28m/sec)
12. An aero plane at an altitude of 200m observes the angles of depression of opposite points on the two banks of a river to be 45˚ and 60˚. Find the width of the river (315.4m)
13. Two men on either side of a cliff, 60m high, observe the angles of elevation of the top of the cliff to be 45˚ and 60˚ respectivel Find the distance between two men (94.6m)
14. From the top of a tower the angle of depression of an object on the horizontal ground is found to be 60˚. On descending 20m Vertically downwards from the top of the tower, the angle of depression of the object is found to be 30˚. Find the height of the Tower. (30 m)
15. A pole 6 m high casts a shadow 2√3 m long on the ground, then the sun ′s elevation is
    a) 60^o b) 45^o c) 30^o d) 90^o
16. If AB = 4 m and AC= 8 m , then angle of observation of A as observed from C is
    a) 60^o b) 30^o c) 45^o d) cannot be determined
17. When the sun is 30^o above the horizontal, the length of shadow cast by 50 m building is
    a) 50/√3 m b) 50 √3 m c) 25 √3 m d) none of these
18. When the height of the shadow of a pole is equal to the height of the pole then the elevation of source of light is
    a) 30^o b) 20 √3 c) 60^o d) 45^o
19. The angle formed by the line of sight with the horizontal, when the point being viewed is above the horizontal level is called
    a) Vertical angle b) angle of depression c) angle of elevation d) obtuse angle

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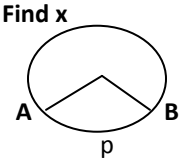
3. AREAS RELATED TO CIRCLES

1) A bicycle wheel makes 5000 revolution in moving 11 km. find the diameter of the wheel **(d = 70 cm)**

2) The radius of the wheel of a bus is 70cm, how many revolutions per minute must a wheel make in order to move at a speed of 66 km/h **(250)**

3) A wheel has diameter 84cm. Find how many complete revolutions must it make to cover 792 metres **(300)**

4) In the figure o is the centre of a circle. The area of sector OAPB is 5/18 of the area of the circle. Find x **(100°)**



5) Area of a sector of a circle is 1/6 to the area of circle. Find the degree measure of its minor arc **(60°)**

6) Area of a sector of a circle of radius 14cm is 154 cm^2 . Find the length of the corresponding arc of the sector **(22 cm)**

7) If the diameter of a semi circle protractor is 14 cm. Find its perimeter **(36cm)**

8) The circumference of a circle A is 132cm. It is equal to the sum of the circumference of two circles B & C, the radius of the circle B is 14cm. Find the radius of circle C. **(r = 7 cm)**

9) The area of quadrant is 154sq cm. Find its perimeter. **(50 cm)**

10) Two circles touch externally. The sum of their areas is 130π sq.cm and the distance between their centres is 14cm. Find the radi Of the circles **(11cm,3cm)**

11) Find the area of a quadrant of a circle whose circumference is 44cm **(38.5cm^2)**

12) The perimeter of a sheet of paper in the shape of a quadrant of a circle is 75 cm. Find its area **(346.5 sqcm)**

13) If the perimeter of the protractor is 72cm, calculate its area **(308cm^2)**

14) A circular disc of 6cm radius is divided into 3 sectors with central angles 120°, 150°and 90°.Find the ratio of the areas of 3 sectors **(4: 5: 3)**

15) The difference between circumferences and diameter of a circle is 105 cm. Find the radius of the circle **(24.5 cm)**

16) Find the area of a major sector of a circle of diameter 42 cm and central angle is 60° **(1155cm^2)**

17) If the area and circumference of a circle are numerically equal, then find the radius of the circle **(2cm)**

18) The length of a rope by which a cow is tethered is increased from 16m to 23m. How much additional area can the cow graze? Now (π =22/7) **(2.38 Θm^2)**

19) What will be the increase in area of circle if its radius is increased by 40% **(96%)**

20) An arc of a circle is of length 5π cm and the sector it bounds has an area of 20π cm^2 . Find the radius of the circle **(8cm)**

21) The circumference of a circle exceeds the diameter by 16.8cm. Find the radius of circle **(3.92cm)**

22) The area enclosed between two concentric circles is 770 sq cm. If the radius of outer circle is 21cm. Find the radius of the inner circle. **(14 cm)**

23) The length of the minute hand of a clock is 7cm. How much area does it sweep in 20minutes **(154/3 cm^2)**

24) The perimeter of a sector of a circle of radius 5.2cm is 16.4cm.Find the area of sector **(15.6cm^2)**

25) Given a circle of radius 9cm, and the length of the chord AB of a circle is 9√3 cm, find the area of the sector formed by arc AB. **(84. 85 cm^2)**

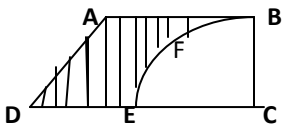
26) Length of minor arc of a circle of radius 10 cm is 14cm. Find the area of minor sector of a circle. **(70cm^2)**

27) A chord 10 cm long is drawn in a circle of radius V50 cm. Find the area of minor segment **(14. 285 cm^2)**

28) A chord AB of a circle of radius 14cm makes a right angle at the centre of the circle. Find the area of the minor segment **(56 cm^2)**

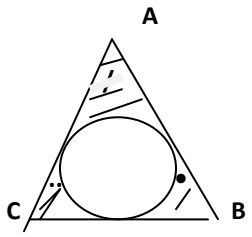
29) A chord of a circle of radius 14cm subtends an angle of 120° at the centre Find the area of the corresponding minor segment of The circle (π = 22/7, √3 = 1.73) **(120.56 cm^2)**

30) From a thin metallic piece, in the shape of a trapezium ABCD in which AB II CD and ∟BCD = 90°, a quarter circle BFEC is removed. Given AB = BC = 3.5 cm and DE = 2cm, calculate the area of the remaining (shaded) part of the metal sheet (π = 22/7)



(6.125 cm^2)

31) In fig , ABC is right triangle right angled at A. Find the area of the shaded region if AB = 6cm, BC = 10cm and 0 is the centre of the in Circle 0f ΔABC (Take π = 3.14) **(11.44 cm^2)**



32) Find the perimeter of the shaded region in the given figure **(132 cm)**

33) If the area of a circle is numerically equal to twice its circumference, then the diameter of the circle is

a) 4 units b) π units c) 8 units d) 2units

34) The area of a circle to the sum of areas of two circles of radii 5 cm and 12 cm is equal to

a) 60 π b) 15π c) 13π d) 169 π

35) The perimeter of a quadrant of radius r is

a) πr/2 b) 2πr c) 1/2r(π + 4) d) none of these

36) The area of sector of angle p of a circle with radius 2r is

a) $\frac{p \times 2\pi r}{180}$ b) $\frac{p \times \pi r^2}{90}$ c) $\frac{p \times \pi r^2}{180}$ d) none of these

37) The area of the region enclosed between two concentric circles of radii 8 cm and 4 cm is

a) 48 cm^2 b) 80 cm^2 c) 48 π cm^2 d) 80 π cm^2

38) The radii of two circles are 4 cm and 3 cm respectively. The diameter of the circle having area equal to the sum of the areas of The two circles is

a)5 cm b) 7 cm c) 10 cm d) 14 cm

39) If an arc makes an angle of 72^o at the centre of a circle of radius 10 cm, then its length is :

a) 4 π cm b) 6 π cm c) 7 π cm d) 8 π cm

4. SURFACE AREAS AND VOLUMES

1) A well of a diameter 3m is 14m deep dug the earth taken out of its spread evenly all around it to form an embankment of width 4m. Find the Height of the embankment (1.125m)

2) The radius of the base and the height of a right circular cylinder are in the ratio 2: 3 and its volume is 1617 cu. Cm. Find the Curved surface area Of the cylinder ($\pi = 22/7$) ($462cm^2$)

3) solid cylinder of diameter 12 cm and height 15 cm is melted and recast into toys with the shape of a right circular cone mounted on a hemisphere of radius 3cm, if the height of the toy is 12 cm, find the number of toys (12)

4) A farmer connects a pipe of internal diameter 20cm from a canal into a cylindrical tank in the field which is 10m in diameter and 2 meter deep? If water flows through the pipe at the rate of 6km per hour. In how much time the tank will be filled (5/6hrs)

5) A rocket in the form of a circular cylinder closed at the lower end. The diameter and height of the cylinder is 6m and 12m. The Cylindrical portion is Surmounted by a cone of the same radius that of cylinder, the slant height of the conical portion is 5cm. Find its total surface area and volume

6) A cylindrical pipe has inner diameter of 7cm. Water is flowing through it at 192.5 liters per minute. Find the speed of the flow of water in km/hr.

($301.44 cm^2$, $376/8cm^3$)

7) A solid is in the form of a cylinder with hemispherical ends. The total height of the solid is 19cm and the diameter of the Cylinder is 7 cm. Find the total surface area of a solid. ($418cm^2$)

8) A wooden article was made by scooping out a hemisphere of radius 7cm, from each end of a solid cylinder of height 10cm and diameter 14cm Find the total surface area of the article ($1056cm^2$)

9) The sum of the radius of the base and height of a solid cylinder is 37cm. If the total surface area of the solid cylinder is 1628sqcm. Find the Volume of the cylinder. ($4620cm^3$)

10) A cube and cuboids have the same volume, the dimension of the cuboid are in the ratio 1:2:4. If the difference between the Cost of polishing The cuboid and the cube at the rate of Rs 5 per sq m is Rs 80. Find their volumes

11) Three cubes of a metal whose edges are in the ratio 3: 4: 5 are melted and converted into a single cube whose diagonal is $12\sqrt{3}$. Find the edges of three cubes (6, 8, 10)

12) Three cubes of each side 5 cm are joined end to end. Find the surface area of the resulting cuboids ($350 cm^2$)

13) The surface area of a sphere is 616 cm^2. Find its radius (7 cm)

14 A path of 7m width runs around outside a circular park whose radius 18m. Find the area of path ($946cm^2$)

15) How many spherical lead shots each 4.2cm in diameter can be obtained from a rectangular solid of Lead with dimensions 66cm, 42cm and 21cm. (1500)

16) A solid right circular cone of diameter of 14cm and height 8 cm is melted to form a hollow sphere. If the external diameter of the sphere is . 10cm. Find its internal diameter. (6cm)

17) A cone of base radius 20cm is divided into two parts by drawing a plane through the mid point of its Axis parallel to its base. Find the ratio of the Volume of the two parts. (1:7)

18) 21 Glass spheres each of radius 2cm are packed in a cuboidal box of internal dimensions 16cmx8cmx8cm and the box is filled with water. Find the volume of water filled in the box ($320cm^3$)

19) The radii of the internal and external surfaces of a metallic spherical shell are 3 cm and 5 cm reactively. It is melted and recast into a solid t right circular cylinder of height 10 ⅔ cm. Find the diameter of the base of the cylinder (7cm)

20) A spherical copper shell, of external diameter 18cm, is melted and recast into a solid cone of base radius 14cm an Height 4 3/7cm Find the inner diameter of the shell (16cm)

21) A hollow sphere of internal and external diameters 4cm and 8cm respectively is melted to form a cone of base diameter 8cm. Find the height And the slant height of the cone (14cm, $2\sqrt{53}$cm)

22) The surface area of the sphere and cube are numerically equal. Prove that the volumes are in the ratio $\sqrt{6} : \sqrt{\pi}$

23) A bucket is in the form of a frustum of a cone with a capacity of 12308.8 cucm. The radii of the top and Bottom are 20cm and 12cm. Find the height of the bucket (15cm)

24) The radii of the circular ends of a bucket of height 15 cm are 14 cm and r cm($r < 14$ cm). If the volume of bucket is $5390cm^3$, then find the value r. (r = 7 cm)

25) The slant height of a frustum of a cone is 5 cm. If the difference between the radii of its two circular ends Is 4 cm, write the height of the frustum (3 cm)

26)The slant height of a frustum of a cone is 4 cm and the circumferences of its circular ends are 18cm and 6 cm. Find curved surface area of the Frustum. ($48cm^2$)

27) A bucket made up of a metal sheet is in the form of a frustum of a cone of high 16cm with diameter of its lower and upper end are 16cm and 40cm. Find the volume of the bucket. ($10449.92cm^3$)

28) A tent is made in the form of a frustum of cone surmounted by another cone as shown in the figure. The diameters of the Frustum is 24m And 8m and the height of the frustum is 15m. If the total height of the tent is 18m, find the Quantity of Canvas required. Find the cost at Rs 7 per sqm (Rs 6423)

29) An open metal bucket is in the shape of a frustum of a cone of height 21 cm with radii of its lower and upper ends as 10 cm and 20 cm Respectively . Find the cost of milk which can completely fill the bucket at Rs 30 per litre (15.4 litre, Rs 462)

30) A cylinder and a cone are of same base radius and of same height. Find the ratio of the volume of cylinder to that of the cone **(3:1)**

31) The radii of the circular ends of a solid frustum of a cone are 18 cm and 12 cm and its height is 8 cm. Find its total Surface area

32) Total surface area of a cube is 216 cm^2, its volume is

a) 216 cm^3 **b) 144 cm^3** **c) 196 cm^3** **d) 212 cm^3**

33) The ratio of the total surface area of a solid hemisphere to the square of its radius

a) 2π : 1 **b) 3π : 1** **c) 4π: 1** **d) 1 : 4π**

34) The radii of the circular ends of a bucket of height 40 cm are 24 cm and 25 cm. The slant height of the bucket

a) 51 cm **b) 49 cm** **c) 43 cm** **d) 41 cm**

35) Two cubes have their volume in the ratio 1 : 64. What is the ratio of their surface areas

a) 1 : 4 **b) 1 : 16** **c) 1 : 2** **d) 4 : 1**

36) The ratio of volume of a cone and a cylinder of equal diameter and equal height is

a) 3 : 1 **b) 1 : 3** **c) 1 : 2** **d) 2 : 1**

37) The perimeter of a square circumscribing a circle of radius a cm is

a) 8 a **b) 4 a** **c) 2 a** **d) 16 a**

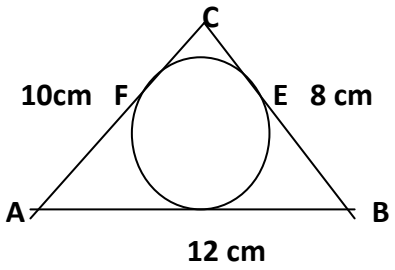
38) The radius of the largest right circular cone that can be cut out from a cube of edge 4.2cm is

a) 4.2 cm **b) 2.1 cm** **c) 8 .1 cm** **d) 1.05 cm**

5. CIRCLES

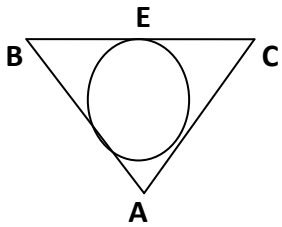
1. Two tangents PA and PB are drawn from an external point P to a circle with centre o. Prove that AOBP is a cyclic quadrilateral

2. If circle is inscribed in a ΔABC having sides 8 cm ,10 cm, 12 cm as shown in the figure. Find AD, BE and CF

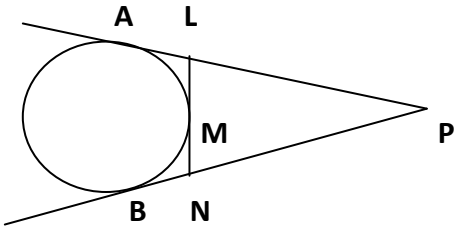


3. A circle is touching the side BC of a triangle ABC at P and AB and AC produced at Q and R respectively Prove that AQ = AR = ½ perimeter of triangle ABC

4. in the isosceles ΔABC, AB = AC, show that BE = EC



5. In the figure, PA and PB are tangents from P to the circle with centre O. LN touches the circle at M, Then show that PL + LM = PN + NM



6. Two concentric circles are of radii 7 cm and r cm, where r > 7. A chord of the larger circle, of length 48 cm touches the smaller circle. Find the value of r (25 cm)

7. In figure a triangle ABC is drawn to circumscribe a circle of radius 2 cm such that the tangents BD And DC into which BC is divided by the point of contact D are the lengths 4 cm and 3 cm. If area of ΔABC = 21 cm^2, then find the lengths of sides AB and AC (7.5 cm, 6.5 cm)

8. Two tangents PA and PB are drawn to the circle with centre o such that ∟APB = 120^o. Prove that OP = 2 AP

9. Two concentric circles are of radii 13 cm and 5 cm. Find the length of the chord of the larger circle Which touches the smaller circle (24 cm)

10. PQ is a chord of length 16 cm of a circle of radius 10cm . The tangent at P and Q intersect at T. Find the length of PT

6. COORDINATE GEOMETRY

1) Show that the points (a, a), (-a, - a) and (- √3a, √3a) are the vertices of an equilateral Δ

2) Show that four points (0,-1), (6, 7), (-2, 3) and (8, 3) are the vertices of a rectangle

3) Prove that the diagonals of a rectangle with vertices (0, 0), (a, 0), (a, b) and (0, b) bisect each each other and are equal.

4) Prove that (4, -1), (6, 0), (7, 2) and (5, 1) are the vertices of a rhombus. Is it a square?

5 Show that the points A(3 , 5), B(6 , 0) ,C(1 ,-3) and D(-2 , 2) are the vertices of a square ABCD

6) Show that the following points are the vertices of a right angled isosceles triangle: (1, 2), (1, 5) and (4, 2)

7) Find a relation between x and y such that the point (x, y) is equidistant from the points (7, 1) and (3, 5) (x - y = 2)

8) If the distance of P(x, y) from the points A (3, 6) and B (-3, 4) are equal, prove that 3x + y = 5

9) Find the values of x for which the distance between the points P (2, -3) and Q (x, 5) is 10 units (8 or -4)

10) Given A (-2, 3) and AB = 10 units .If ordinate of B is 9, find abscissa of B (-10, 6)

11) Find the coordinates of the point equidistant from three given points A (5, 1), B (-3, -7) and C (7, -1) (2,-4)

12) If the point p(x, y) is equidistant from the points A (a + b, b - a) and B (a - b, a + b), prove that b x = a y

13) Find the point on y- axis which is equidistant from the point (5, -2) and (-3, 2) (0, -2)

14) Find the point on x- axis which is equidistant from the points (2, -5) and (-2, 9) (-7, 0)

15) If the points A (4, 3), and B(x, 5) are on the circle with the centre. O (2, 3), find the value of x (x=2)

16) The three consecutive vertices of a parallelogram are (-2, 1), (1, 0) and (4, 3). Find the Coordinates of the fourth vertex (1, 4)

17) If (1, 2) (4, y), (x, 6) and (3, 5) are the vertices of a parallelogram taken in order , find the value of x and y (x =6, y = 3)

18) Find the value of k for which the points (7, -2), (5, 1), and (3, k) are collinear. (k = 4)

19) Find the value of m, for which the points with co-ordinates (3, 5), (m, 6) and [1/2, 15/2] are collinear (m = 2)

20) Find the value of p for which the points (p + 1, 2p – 2), (p -1, p) and (p – 3, 2p – 6) are collinear.

21) Find a relation between x and y, if (x, y), (1, 3) and (8, 0) are collinear (3x +7y = 24)

22) If the points (-2, 1), (a, b) and (4,-1) are collinear and a - b = 1, then find the values of a and b (a =1, b = 0)

23) Check whether the points (4, 5), (7, 6) and (6, 3) are collinear.

24) Show that the point P (- 4, 2) lies on the line segment joining the points A(-4, 6) and B(-4 ,-6)

25) If A (-5, 7), B (-4, -5), C (-1, -6) and D (4, 5) are the vertices of a quadrilateral, find the area of the quadrilateral ABCD.

26) Using A (4, -6), B (3, -2) and C (5, 2), verify that a median of the ΔABC divides it into two triangles of equal areas

27) The coordinates of A, B, C are (3, 4), (5, 2), (x, y) respectively. If area of ΔABC = 3, show that x + y = 10

28) The coordinates of the vertices of ΔABC are A (4, 1), B (-3, 2) and C (0, k).Given that the area of ΔABC is 12 unit^2, Find the Value of k (k = - 13/ 7)

29) The points A (2, 9), B (a, 5), C (5, 5) are the vertices of a triangle ABC right angled at B. Find the value of a and hence the area of ΔABC (a =2, area = 6sq units)

30) If point P (1/2, y) lies on the line segment joining two points A (3, -2) and B (-7, 9), then find the ratio in which P divides AB. Also find the value of y

31) Find the ratio in which the point (2, y) divides the line segment joining the points A (-2, 2) and B (3, 7) (4: 1)

32) Find the ratio in which the line 2x + y – 5 = 0 divides the line segment joining A (2 ,-3) and B (3, 9) (2:5)

33) Find the ratio in which the line segment joining the points (1, -3) and (4, 5) is divided by x - axis

34) If P divides the join of A (-2, -2) and B (2, -4) such that AP/AB = 3/7, find the coordinates of P (-2/7, -20/7)

35) Find the coordinates of the points which divide the line segment joining A (2, -3) and B (-4, -6) into three equal parts

36) Find the length of medians of triangle whose vertices are A (-1, 3), B (1, -1), and C (5, 1)

37) The coordinates of one end point of a diameter of a circle are (4, -1) and the coordinates of the centre of the circle are (1, -3) Find the coordinates of the other end of the diameter (-2, -5)

38) The centre of a circle is (2a – 1, 7) and it passes through the point (-3, -1). If the diameter of the circle is 20 units, then find the value of a

7. PROBABILITY

1. Two dice are thrown together. Find the probability that the product of the numbers on the top of the dice is
a) 6 b) 12 c) 7 (1/9, 1/9, 0)

2. Two different dice are thrown at the same time. Find the probability that the sum of the two numbers appearing On the top of the dice is 7 (1/6)

3. A pair of dice is tossed once, find the probability of getting
a) a total of 2 (1/36)
b) a total of 5 (1/9)
c) an even number as the sum (1/2)
d) same number on each dice (1/6)

4. A die is thrown once. Find the probability of getting the following:
a) a prime number (1/2)
b) a number lying between 2 and 5 (1/3)

5. A card is drawn at random from a well shuffled pack of playing cards. Find the probability of getting a red face card (3/26)

6. One card is drwn from a well shuffled deck of 52 playing cards. Find the number of probability of getting
a) A face card (3/13)
b) A black queen or a red king (1/13)
c) a king of red colour (1/26)
d) the jack of hearts (1/52)
e) a spade. (1/4)
f) either a king or a queen (2/13)
g) neither a king nor a queen (11/13)

7. From a pack of 52 playing cards, Jacks, Queens, Kings and Aces of red colour are removed. From the remaining, A card is drawn at random. Find the probability that the card drawn is
a) A black queen (1/21)
b) A non – face card (10/13)
c) A black jack (1/22)
d) a Black King or a Red Queen (1/13)

8. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball from the bag is thrice that of red ball, find the number of blue balls in the bag (15)

9. A bag contains 6 red, 3 black and 6white balls. A ball is selected at random from the bag. Find the probability that the selected ball is
a)Red or black b) not black (3/5, 4/5)

10. Cards marked with numbers 5,6,7,……..74 are placed in a bag and mixed thoroughly. One card is Drawn at random from the bag. Find the probability that the number on the card is a perfect square (3/35)

11. Cards numbered 2,3, 4, 5, 6, -------,49 are put in a box and mixed thoroughly. If one card is drawn at random Find the probability that the number on the card is
a) Even number (1/2)
b) prime number (5/16)
c) Divisible by 6 (1/6)
d) A perfect square (1/8)

12. Two unbiased coins are tossed. Calculate the probability of getting
a) Exactly two heads (1/4)
b) At least two tails (1/4)

c) At most two tails **(3/4)**

13. A letter is chosen at random from the English alphabet. Find the probability that the letter chosen

a) Is a vowel **(5/26)**

b) Is a consonant **(21/26)**

c) Follow r **(8/26)**

14. Find the probability of 53 Sundays in the year 2012 **(2/7)**

15. Which of the following cannot be the probability of an event?

a) 1/5 b) 0.3 c) 4% d) 5/4

16. A card is drawn from a pack of 52 playing cards. The probability of getting a face card is

a) 3/13 b) 4/13 c) ½ d) 2/3

17. The probability of drawing a red queen from a well shuffled deck of 52 cards is

a) 1/13 b) 2/13 c) 1/26 d) 1/52

18. A die is thrown, the probability of getting a number less than 3 and greater than 2 is

a) 0 b) 1 c) 1/3 d) 2/3

19. A card is drawn from a well – shuffled deck of 52 playing cards. The probability that it is not a face card is

a) 12/52 b) 16/52 c) 10/13 d) 9/13

20. If an event cannot occur then its probability of occurring is

a) 1 b) 2/3 c) ½ d) 0

21. The probability of getting a perfect square number from the numbers 1 to 10 is

a) 3/10 b) ½ c) 2/5 d) 1/5

22. The probability of throwing a number less than 6 with a fair die is

a) 5/6 b) 1 c) 1/6 d) 2/3

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8. QUADRATIC EQUATIONS

1) Solve for x: $4x^2 - 4a^2x + (a^4 - b^4) = 0$ $\left(a^2 + b^2/2,\ a^2 - b^2/2\right)$

2) find the value of k so that the quadratic equation has equal roots:

$(k + 3)x^2 + 2(k + 3)x + 4 = 0$ (1, - 3)

3) For what value of p the equation $(1 + p)x^2 + 2(1 + 2p)x + (1 + p) = 0$ has coincident roots (0, -2/3)

4) Find the roots of the following quadratic equation by the method of completing the Square.

$a^2x^2 - 3abx + 2b^2 = 0$ (2b/a, b/a)

5) Solve the following quadratic equations by factorization method:

a) $3x^2 - 2\sqrt{6}x + 2 = 0$ $(\sqrt{2}/3, \sqrt{2}/3)$

b) $x^2 - 5\sqrt{5}x + 30 = 0$ $(3\sqrt{5}, 2\sqrt{5})$

6) Solve for x: $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$, $a + b \neq 0$ (-a, -b)

7) Solve for x: $\frac{x}{x+1} + \frac{x+1}{x} = \frac{34}{15}$ (3/2, -5/2)

8) Solve for x: $\frac{1}{x-3} - \frac{1}{x+5} = \frac{1}{6}$ (7,-9)

9) Solve for x: $2\left[\frac{2x-1}{x+3}\right] - 3\left[\frac{x+3}{2x-1}\right] = 5$ (-10, -1/5)

10) The sum of the squares of two consecutive odd numbers is 394. Find the numbers. (13, 15)

11) The sum of the squares of two consecutive multiples of 7 is 637. Find the multiples

12) The product of 3 consecutive even numbers is equal to 20 times their sum. Find the numbers (6, 8, and 10)

13) The sum of the areas of two squares is 640 m^2. If the difference in their perimeter is 64m .Find the sides of the two squares (8m, 24m)

14) The difference of two numbers is 4. If the difference of their reciprocals is 4/21, find the numbers (3, 7)

15) The perimeter of a right angled triangle is 70units and its hypotenuse is 29 units. Find the lengths of the other sides (20, 21)

16) The length of the sides forming a right angled Δ is 5x cm and (3x – 1) cm. Area of the triangle is 60 cm^2. Find the hypotenuse (17cm)

17) A natural number, when increased by 12, becomes equal to 160 times its reciprocal. Find the number (8)

18) A takes 6 days less than the time taken by B to finish a piece of work. If both A and B together Can finish it in 4 days; find the time taken by B to finish the work (12 days)

19) A two digit number is such that the product of its digits is 18. When 63 is subtracted from the number, the digits interchange their places. Find the number (92)

20) The speed of a boat in still water is 15 km/hr. It can go 30km upstream and return downstream to the original point in 4hrs 30min. Find out the speed of the stream (5km/hr)

21) A train travels 180km at a uniform speed. If the speed had been 9 km/ hr more, it would have taken 1 hour less for the same Journey. Find the speed of the train. (36km/hr)

22) A plane left 30 minutes late than its scheduled time and in order to reach the destination 1500km away in time it had to Increase the speed by 250 km/h from the usual speed. Find its usual speed (750 km / hr)

23) The age of father is equal to the square of the age of his son. The sum of the age of father and five times the age of the son Is 66 years. Find their ages (36y, 6y)

24) Two water taps together can fill a tank in 6 hrs. The tap of larger diameter takes 9 hrs less than the smaller one to fill the Tank separately. Find the time in which each tap can separately fill the tank (18hrs, 9 hrs)

25) Rs 1200 were distributed equally among certain number of students. Had there been 8 more students, each would have Received Rs 5 less. Find the number of students. (40)

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