Kalladi HSS Kumaramputhur

A+ learning guide

Prepared by 10 J Students – 2020

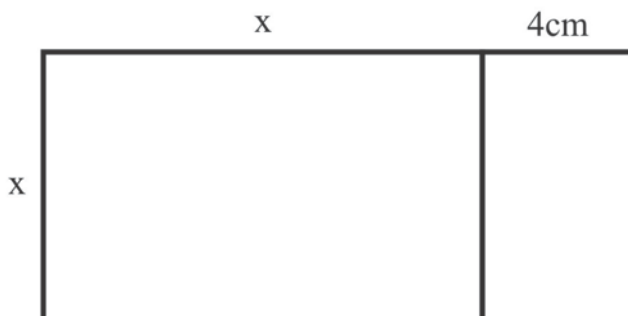**Under the guidance of Rajesh Manjeerithodi, Mannarkkad**

Group Members

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Second Degree Equations

A+ L

Q)   The figure shown below 2 parallel sides of a square extended by 4 cm to make a rectangle. The area of new rectangle is 396 sq.cm. Find the sides of square and sides of rectangle

Q)   A train travels distance of 300 km at a constant speed. If the speed of the train increased by 5 km, the journey would have taken 2 hours less. Find the original speed of the train

Q)   The product of two continuous terms of an AS is 36. Common difference is 5. Write sequence.

Q)   One Arts Day 180 sweets were distributed equally among the students. Tasting the sweet, Deepu said "It is a pity that nine of our friends are absent today"

Hearing this Deepu said "Because of that we got 1 sweet more"

i)   Find out the total number of students

ii)   How many students were absent on that day?

iii)   The sum of a number and its reciprocal is 25/12. What is that number? Prove that the sum of a natural number and its reciprocal cannot be 61/30.

Q)   In a square shaped site, 1 cm from all four sides ends has sold. Then the remaining space area became 16 cm^2.

i)   What was the length of one side?

ii)   What is the length of one side?

Q)   x, x+3, x+6 is an A.S. The square of second term is 36

i)   Find common difference?

ii)   Find first term?

iii)   Find the A.S?

Q)   The sum of square of a number and 3 times of it is 28. Find the numbers.

Q)   The square of a number added to 2 is 81. Find the number?

Q)   Sabu needs 6 days more to finish a work than Geetha. If they work together, they can finish the work in 4 days. How many days each need to complete the work alone?

Q)   The perimeter of a rectangular sheet of paper is 42 cm. Its diagonal is 3 cm less than 2 times the breadth. Find the length and breadth of the paper.

Q) Find answer of following equations.

i) $(a+b)^2$

ii) $(1.5+2)^2$

Probability

A+ Level Questions

1. In a box there are 6 oranges and 4 apples. In another box, there are 3 oranges and 7 apples. From each box, if one fruit is taken, without looking into it, find the probability of

i) both being oranges

ii) probability of both being apples

iii) probability of atleast one orange

2. Venu asked Manu to say 2 digit number. What is the probability that the 2 digits in that number are equal?

3. In 10-J division, there are 13 boys and 32 girls and in 10-A division, there are 20 boys and 10 girls. What is the probability of choosing a boy as the leader of both the classes?

4. One is asked to say 3 digit number. What is the probability of getting the same number of digits?

5. A box contain 4 paper slips numbered 1, 2, 3, 4 and another contain 4 slips numbered 2, 3, 4, 5. If one slip is taken from each

i) What are the possible pairs of numbers?

ii) What is the probability of both the numbers being odd?

iii)   What is the probability of their sum 2?

6.   In a box contain 5 red bulb and 2 blue bulb. Another box contain 6 red bulb and 5 blue bulb.

*   probability of both being red bulb?

*   probability of both being blue bulb?

*   probability of atleast blue bulb?

7.   Chippu and Sinshu to say 3 digit number. What is the probability that the 3 digit in that number or equal?

8.   Tokens with number 1 to 5 are put in a box. Tokens with number 2 to 5 are put in another box. A token each is taken from box.

*   Write all possible pairs?

*   What is the probability of the product of the number is a multiple of 2?

*   What is the probability of the product of the number is a multiple of 3?

9.   In a school 20 students in a Malayalam class and 40 students in a English class. And another school contain 30 students in a Malayalam class and 50 students in the English class.

*   What is the chance of both students in Malayalam class?

*   What is the chance of both students in English class?

10.   Lachus tossed two coin simultaneously.

Find the probability of getting one head?

        probability of getting two head?

        probability of getting atleast one head?

probability of getting atmost one head?

11. We are tossing a coin 3 times?

Chance of getting 3 head?

Chance of getting 3 tale?

Chance of getting exactly 1 tale?

Chance of getting atleast 1 tale?

B+ Level Questions

1. A box contain the slips of 2 digit number when we take one slip from it,

   a) What is the probability to get perfect square?

   b) What is the probability to get multiple of 10?

   c) What is the probability to get odd number?

   d) What is the probability to get prime number?

   e) What is the probability to get two digit are same?

2. If we are tossing a coin 3 times;

   i) Chance of getting 3 head?

   ii) Chance of getting 3 tail?

   iii) Chance of getting exactly 1 tail?

   iv) Chance of getting atleast 1 tail?

3. A box contain 15 balls some black and some white probability of getting black balls is 1/3;

i)   How many black balls?

ii)   How many white balls?

iii)   If one black ball is removed what would be the probability of getting black from the remaining balls?

4.   A box contains black balls and white balls. Another box contains 10 black balls and 12 white balls. What is the probability to get **_2 and_** white?

i)   What is the probability to get 2 are black?

ii)   What is the probability to get 1 black and 1 white?

iii)   What is the probability to get **_atleast black_**?

5.   A class room contains 20 boys and 10 girls. Another class room contain 15 boys and 15 girls.

a)   Chance of getting both being boys?

b)   Chance of getting both being girls?

c)   Chance of getting atleast one boy?

d)   Chance of getting exactly one boy?

C+ Level Questions

1.   A box contains 15 balls. Some black and some white. Probability of getting black balls 1/3.

a)   How many black balls?

b)   How many white balls?

c)   If **_one_** black ball is removed, what would be the probability of getting of ball from the remaining balls?

2. A class room contains 20 boys and 10 girls. Another class room contains 15 boys and 15 girls.

   a) Chance of getting both being boys?

   b) Chance of getting both being girls?

   c) Chance of getting exactly one boy?

   d) Chance of getting atleast one boy?

3. There are 30 scouts and 20 guides in a school. In another school there are 20 scouts and 15 guides. From each school, one student among them is to be selected for participation in a seminar.

   a) What is the total number of possible selections?

   b) What is the probability of both being scouts?

   c) What is the probability of both being guides?

   d) What is the probability of one scout and one guide?

4. What is the probability that there will be 5 Sundays in the month of January?

5. In a box there **_are_** black beads and white beads. Total is 24. If we took one white bead from it, the probability is 1/3 then;

a) Find the number of white beads?

b) Find the number of black beads?

6. There are slips numbered from 1 to 3 are put in a box. Without looking into the box, one slip is taken;

a) What is the probability that both are same numbers?

b)   What is the probability that both are odd numbers?

c)   What is the probability that both are perfect squares?

TRIGANOMETRY

1.   A boy 1.4 m tall standing at the end of river bank sea the top of tree on the edge of other bank back by 3 cm he sees it at the elevation of 45^0.
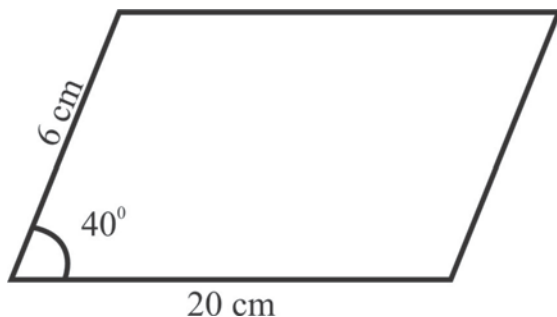
a)   How wide the river?

b)   How tall the tree?

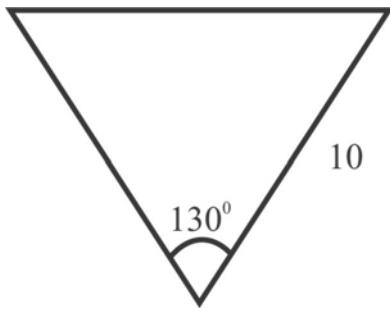2.   In the right Δ^{le} $ABC < C = 38^0$ $BC = 7\ cm$

a)   Taking $TAN\ C$. Find AB?

b)   Taking $COS\ C$. Find AC?

c)   Taking $SIC\ C$. Find AB?

3.   Find the height and area of the below parallelogram

4.   Find the following

a)   Height of the triangle

b)   Area of the triangle

5. Find the length of AB
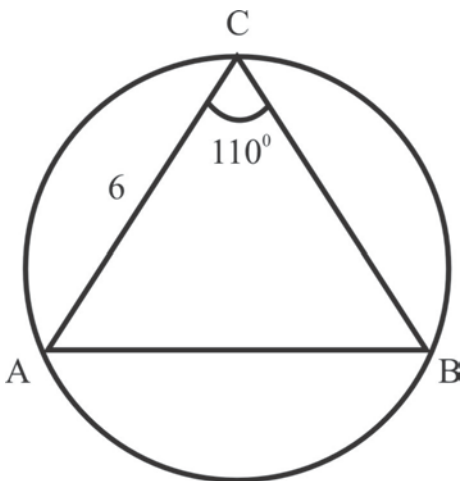
6. A man of height 1.7 meters standing at the bank of a river sees the top of a tower at an elevation of 50^0. Stepping 15 meters back, he sees at an elevation of 37^0.

a) How wide the river?

b) What is the height of tower?

7. A man 1.25 meters tall standing at the foot of a tree sees the top of a building 70 meters away at an elevation of 40^0. On climbing to the top of the tree he sees the top of building at an elevation of 30^0.

a) Find the height of tree?

b) Find the height of the building?

8.   A man on ground observe a bird flying at a speed of 20 meters per second at an elevation 40^0. After 5 seconds, it is seen at an elevation of 30^0.

i)   Draw the picture

ii)   Find the height of bird flying

9.   Draw equilateral triangle with side $2\sqrt{3}$

10.   A man standing in front of a mirror sees the reflection of his belt at an angle of depression 50^0. Distance of mirror from the man is 45 cm.

a)   Draw a rough figure

b)   Find the distance from the person's eyes to belt

c)   Find the distance from person's eye to reflection of light

d)   Find the angle of elevation from reflection of belt to eyes of the person.

       (The angle that formed at the belt is 90^0)

1. AB, AE, AC are chords of the circle

    i) Prove that $\triangle ADC$ and $\triangle ABE$ are similar

    ii) Prove that are

    $\dfrac{AB \text{ x } BC \text{ x } CA}{2AE}$
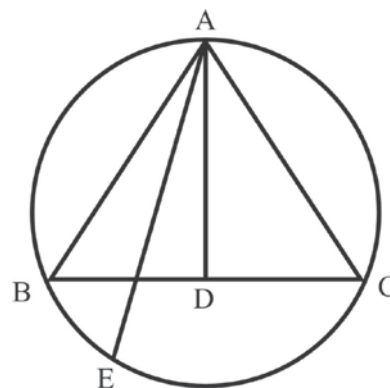
2. In the figure AB is the diameter of AB and CD

    PA = 4 cm, PB = 2 cm

    i) What is the length of PD

    ii) Draw equilateral Δle

        Perimeter $\sqrt[6]{8}\ cm$
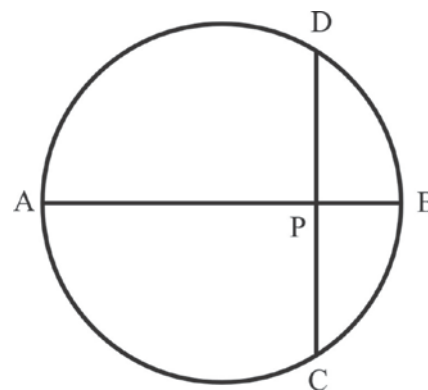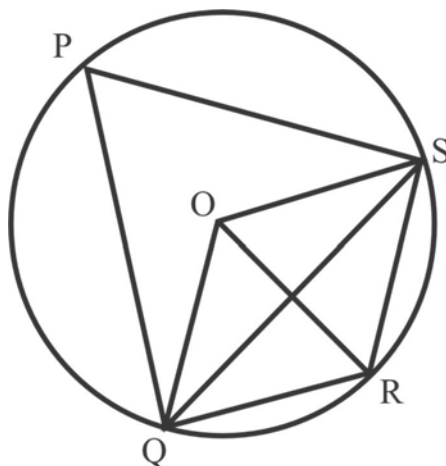
3. In the figure P, Q, R and S are points of a circle. O is the centre of circle

    i) $\angle ROS$

    ii) $\angle OSQ$

    iii) $\angle P$

iv)　　∠QSR

v)　　∠SQR

vi)　　∠QOR

4.　In the figure the chord AB and CD extended P.

　　i)　　Write one pair of equal angles?

　　ii)　　Prove that $PA \; x \; PB = PC$
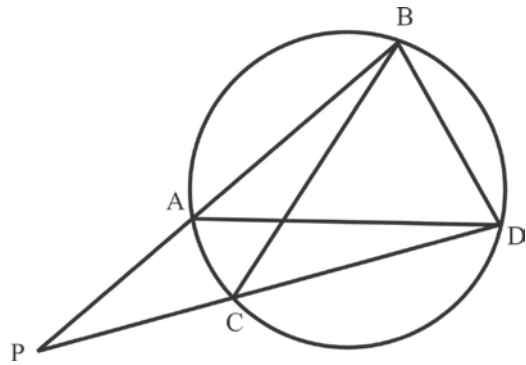
5.　In the figure O is the centre of circle

　　and A, B, C
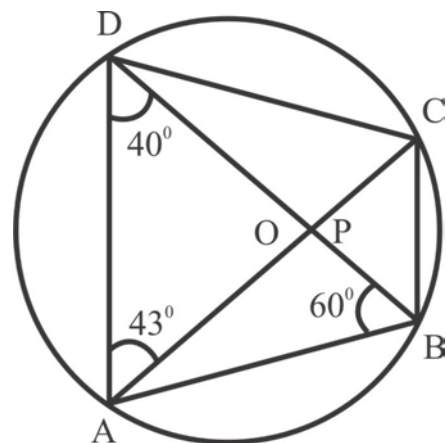
　　i)　　∠OCA

　　ii)　　∠ABC

　　iii)　　Find the length of AC
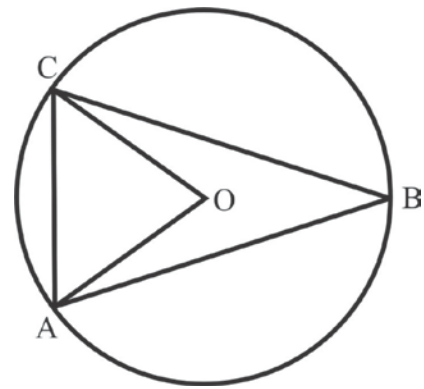
6.　In the figure, O centre of A, B, C, D

　　Are point on its circle
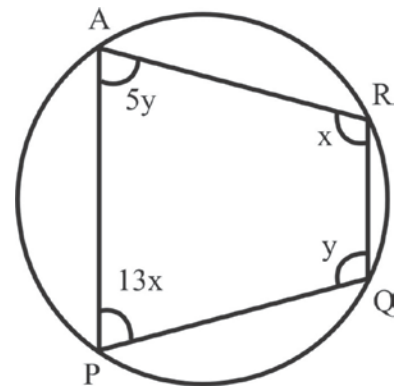
　　i)　　∠ACB

　　ii)　　∠CBD

　　iii)　　∠BCD

iv) $\angle BAC$

v) $\angle DPC$

7.   PQRS is cyclic $\angle P = 3x, \angle a = y, \angle R = x, \angle s = 5y$

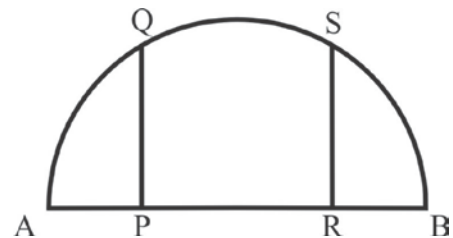Find the angles on it complete PQRS

i)   What is $3x + x$? Find x?

ii)   What is $y + 5y$? Find y?

8.   In the figure AB is diameter

CD is parallel to the diameter

$AB = 8\ cm, BD = 2\ cm$. Find CD?

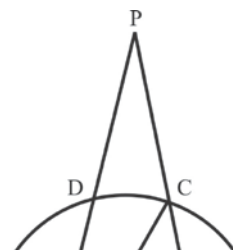9.   Draw a rectangle of length 6 cm and width 4 cm. Draw another Δle having the same area and one side 8 cm.

10.   Draw an equilateral Δle of height 3 cm

i)   What is the length of the sides?

ii)   Write the principle of construction?
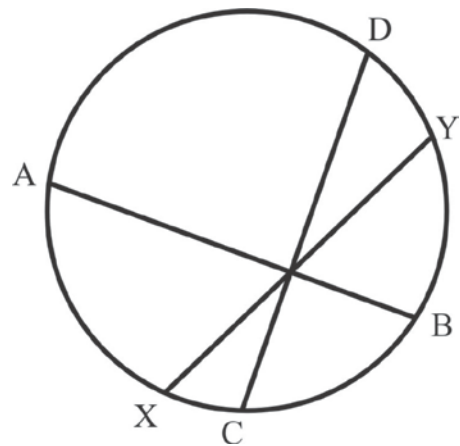
11.   Prove that $\angle APB$ is equal to half the

difference of central angle of arc.

AXB and DYC

12. In the figure that AB, CD, XY intersect at P

    $Ap = 7\ cm, AB = 13\ cm, PD = 12\ cm$

    i)   Find $PX = PY$
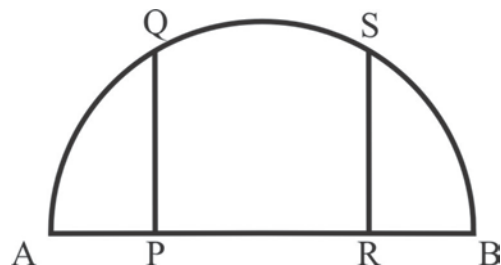
    ii)   Find xy

13. In the figure AB is diameter of semicircle
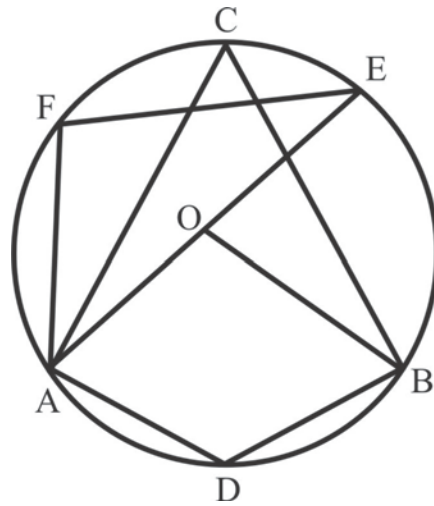
    PQ, RS are meet to AB

    $PQ = \sqrt{18}\ PS = \sqrt{14}$

    i)   Find AB

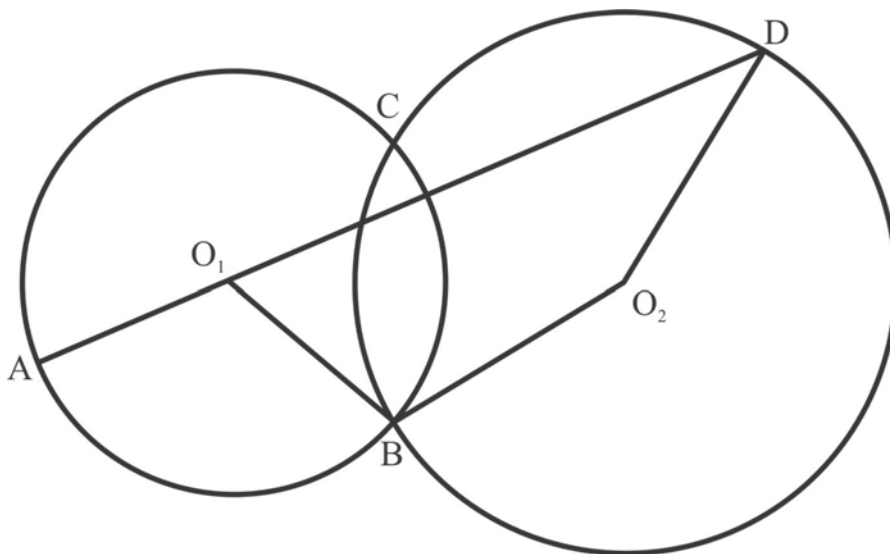   ii)   Draw square having same and area $20cm^2$

14. Draw a circle of radius 4 cm and $\angle ADB$ is the central angle 100^0 using ruler pencil only draw them angle measure 50^0, 130^0 and 90^0.
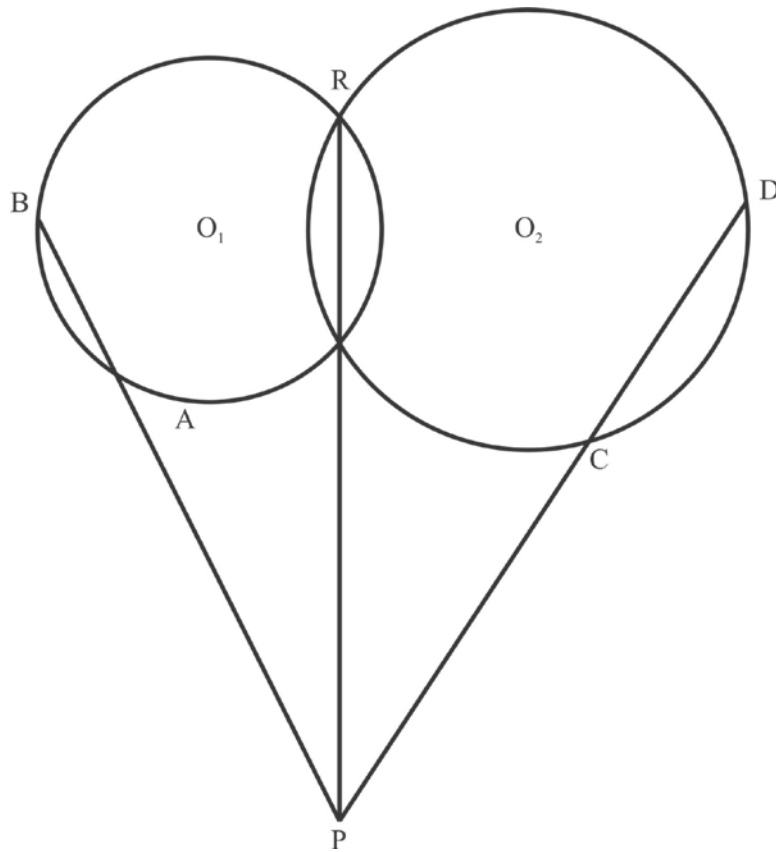
15.   In the figure O_1 and O_2 are the centre of circles $\angle AOB = 130^0$

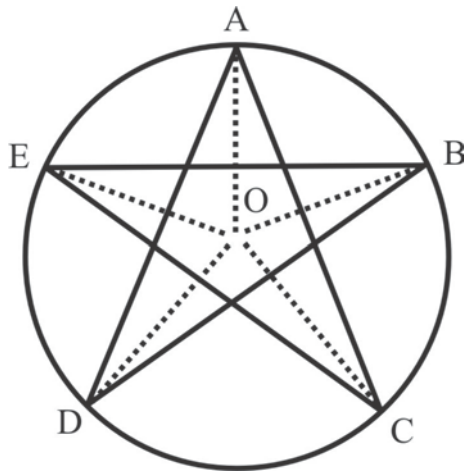Calculate the value of x

16.   In the figure two circles intersect at Q and R. Prove that $PA \times PB = PC \times PD$

17.   In the figure OA, OB, OC, OD, OE are the radius of circle

i) $\angle A \; x \; \angle B \; x \; \angle C \; x \; \angle D \; x \; \angle E = 180^0$

LESSON – COORDINATES

1.   Vertex of a triangle (4, 0) (2, 0) (4, 15)

a)   Draw a rough figure

b)   What type of triangle is this? Prove?
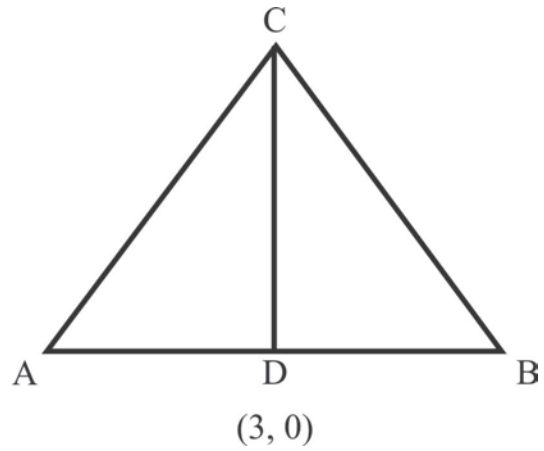
2.   ABC is an equilateral triangle. A and B are on X axis coordinate at D (3, 0) its peremeter is 18 unit.

Find the following coordinates

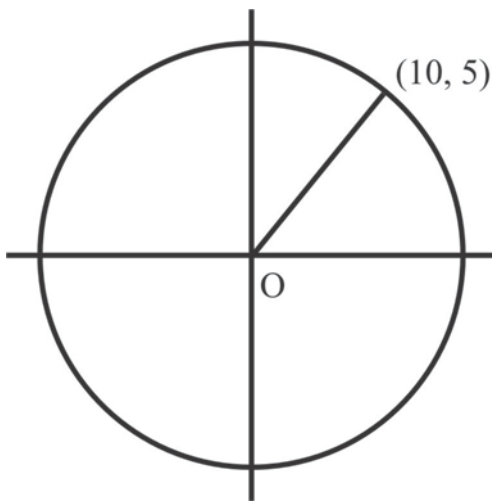a)   Coordinate at A

b)   Coordinate at B

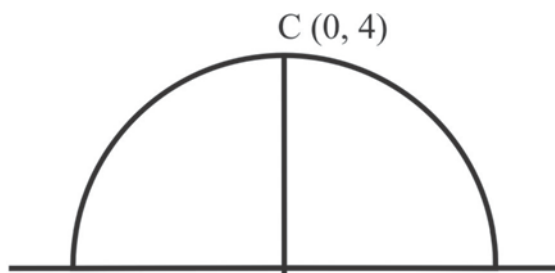c)   Coordinate at C

A circle cuts y axis 13 unit away from its centre

a)   Find the coordinates at 'O'

b)   Find the radius of the circle

c)   Write 8 coordinates on the circle

4.

A semi curcle is drawn on x and y axis cordinates at C is (0, 4) and at A is (-8, 0) and length of PC is 4 unit.

a)   Find the length of PA

b)   Find the length of PB

c)   Find the coordinate at B

5.   In triangle PQR P = (2, 0), Q = (8, 0), ∠P is less than 90^0. PR = 5 Unit and area = 12 unit. A perpendicular is drawn from R to PQ and it meet PA at A.

a)   Draw a rough figure

b)   Find the cordinates at R

c)   Find out the height of the triangle

6.   Draw X and Y axis. Mark coordinates A and B. A = 5, 8 B = 3, 2. If we draw a triangle ABC, BC parallel to X axis
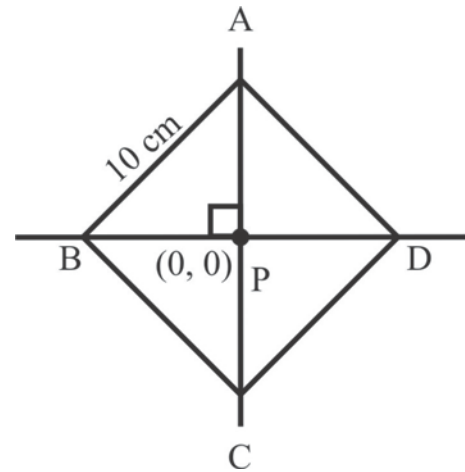
a)   Draw a rough figure

b)   If area of Δle 15 $unit^2$ what will be its height

c)   Find out the coordinates at 'C'

7.   Side of a square 10 cm it diagonal meets at origin

a)   Find out the length of diagonals

b)   Find coordinates at A, B, C, D

8.   ABCD is a rhombus. Its diagonals meet at origin. Length of diagonals are 8 cm, 6 cm

     a)   Draw a rough figure

     b)   Find coordinates of all its vertices

9.   A circle is drawn on X and Y axis as centre as origin radius of circle is 10 unit

     a)   Check whether (6, 9) (6, 8) (5, 9) these coordinates are inside, outside or on the circle

     b)   Write 12 coordinates on the circle

10.   A triangle was drawn with vertex (0, 0) (8, 2) (5, -3) coordinates on x, y axis

     a)   Draw a rough figure

     b)   Prove it is an isolates triangle

11.   ABC is an equilateral triangle with coordinate at its vertex are (-4, 0) (6, 0)

     a)   Draw the coordinate axis and draw rough figure of the triangle

b) Find coordinate at C and length of perpendicular from C to AB which meet at P

c) Find the coordinate at P
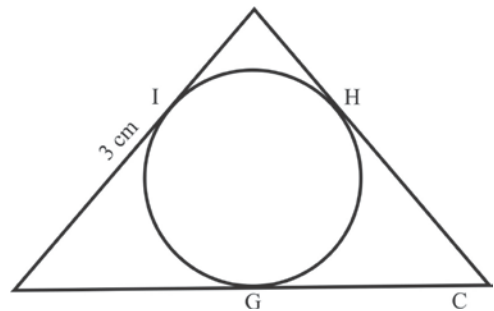
TANGENTS

1. In the figure, $AD = \sqrt[2]{3}, \angle OAC = 30^0, BA = Diameter$

   i. Find $\angle B$ and $\angle C$

   ii. Find radius of the circle
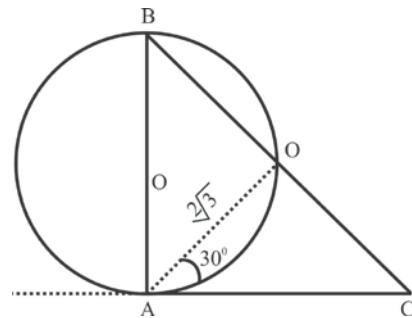
2. In the figure AB = 10 cm, AI = 3 cm and BC = 18 cm

   i. Find the all other lengths

   ii. Find the perimeter of the Δle

3. In the figure AD = 12 cm, AX = 9 cm, AB = 8 cm
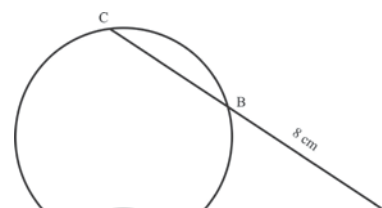
a) Find YX

b) Find BC

4. The angles of Δle ABC are 70^0 and 50^0

   a) Find $\angle AOB$

   b) Find $\angle AQB$

   c) Find the angles of Δle PQR
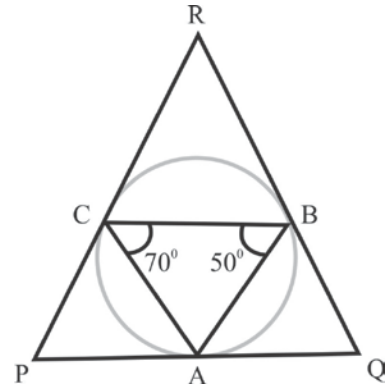
5. QR is a tangent of a circle with centre O. PS is diameter of circle.

   a) Find $\angle QOR$

   b) Find all angles of Δle QRS
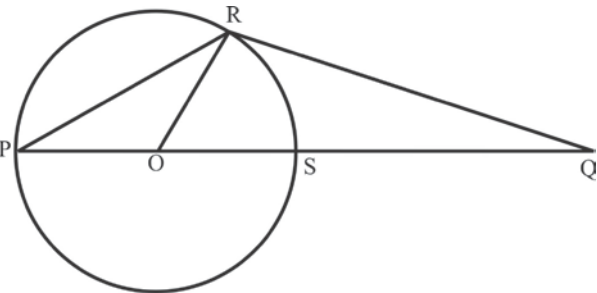
6. In the figure AT = 6 cm, and $\angle POB = 40^0$

   a) What is the length of TP

   b) What is the length of CD

   c) Find $\angle PTB$
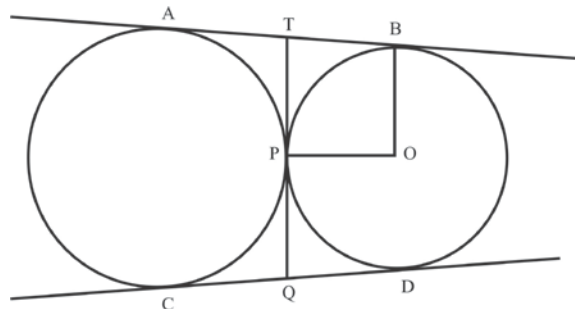
7. In the figure PQ, PR are 2 tangents. Prove that $\angle RPQ + \angle RAQ = \angle RBQ$

8. If R, r are the **_radu_** of 2 circles with centres AB respectively and if 'd'is the distance between A, B. Then prove that the length of the tangents is $\sqrt{a^2 - (R - r)^2}$
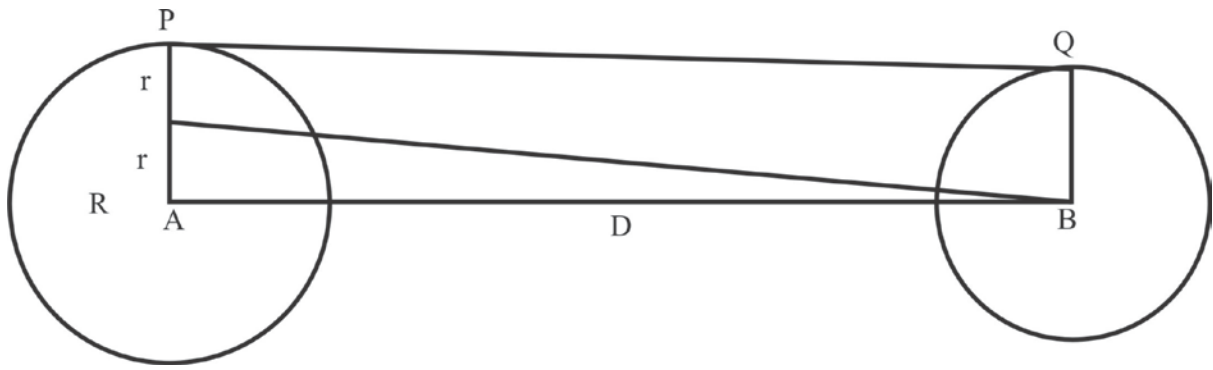
9.   In figure ABC is right triangle BP = 3 cm. If hypotenuse of Δle is 15 cm.

    a)   Find the inradius of circle?

    b)   The perimeter of Δle?

    c)   The area of Δle?
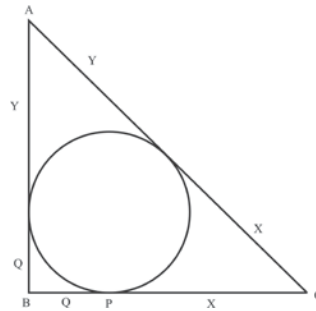
10.   Side of Δle are 13 cm, 14 cm and 15 cm

    a)   Find the perimeter of the Δle

    b)   Find area of the Δle

SOLIDS

1. The given figure is the lateral face of a square pyramid

    AB = AC = 25 cm & BD = BC = 15 cm

    a) What is the length of base cdgc

    b) Find the lateral surface area of the pyramid?
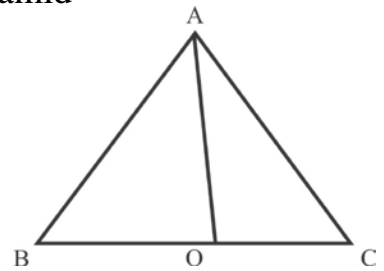
2. A circular sheet of paper is divided into two sectors. Central angle of one of them is 60^0.

    a) What is the central angle of the remaining sector?

    b) These sectors are bent into cones of maximum volume. If the adius of small cone is 8 cm, what is the radius of the other?

    c) What is the stand height of cone?

3. The radius & height of as cone are 12 cm & 6 cm respectively.

    a) What is its volume?

b)   If this cone is cut parallel to its base, along the midpoint of the height, what is the radius of the small cone obtained?

c)   What is the volume of small cone?

d)   Find the ratio of the volumes of the small cone & the first cone

4.   A solid is made by fixing a hemisphere of some radius on the flat face of a cone. The height of the cone is 12 cm & its sland height is 13 cm.

a)   What is the radius of the cone?

b)   What is the curved surface area of the hemisphere?

c)   What is the total surface area of the solid?
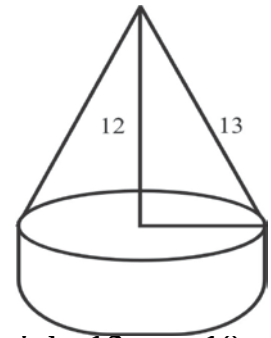
5.   A cone shaped fire work is base diameter 10 cm and its height 12 cm. 10 thousand such fire works are to be covered by coloured paper. The prize of paper is to ___ perimeter square.

a)   Find out the total cost?

6.   The perimeter of a square pyramic is 96 cm. Height 16 cm.

a)   Find out its base edge

b)   Find out its lateral surface area

7.   The base edge of a square pyramid is 10 cm Its height is 2 cm.

a)   Find out its sland height

b)   What is the radius of a cone of maximum size that can be cut from this.
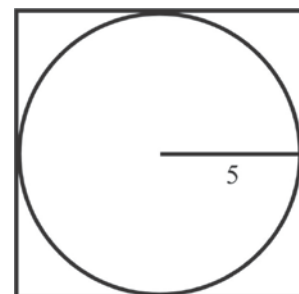
8. Base perimeter of a square pyramid is 64 cm and its volume is 1250 cm. CU. What is the total surface area of square pyramid?

9. A sector of central angle 288^0 is cut from a circle of radius 25 cm and it is rolled up into a cone

   a) What is its base radius?

   b) What is its height of the cone?

   c) Calculate the total surface area of cone?

   d) Find the curved surface area

   e) Find volume of cone

10. The total surface area of a solid sphere is 120 cm. It is split up into 2 hermispheres. Calculate their surface areas.

11. A metal sphere of radius 12 cm is melted and recast into 27 small spheres. What is the radius of each sphere?

12. The picture given below is an opened figure of a square pyramid.

    a) What is its slant height?

    b) Calculate the total surface area?

    c) Calculate its volume?
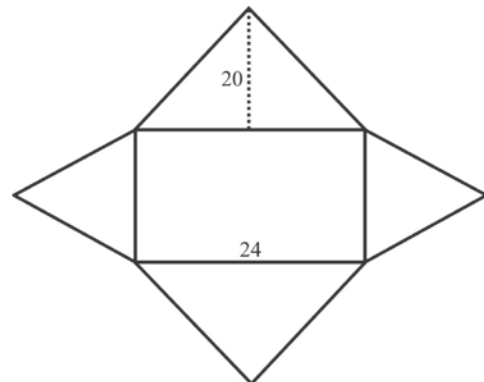
GEOMETRY AND ALGEBRA

- Y coordinate of any point on the x axis is o.

- X coordinate of any point on the y axis is o.

- The coordinate of a point is taken as (x, y)

- The y coordinate of any point on the line parallel to the x axis is always same and x coordinate of any point on the line parallel to y axis is always same.

- All points with the same y coordinate are on a line parallel to the x axis, and the distance between any pair of such points is the difference of their x coordinates

- In the same way, the distance between any pair of points on a line parallel to the y axis is the difference of their coordinates

- Distance between any points (x, y) and (x, y) is $\sqrt{(x,-x)^2 + (y,-y)^2}$

- The distance between the origin and any point (x, y) is $\sqrt{x^2 + y^2}$

- 4th vertex of a parallelogram is $(x_1 + x_2 - x, y_1 + y_2 - y)$
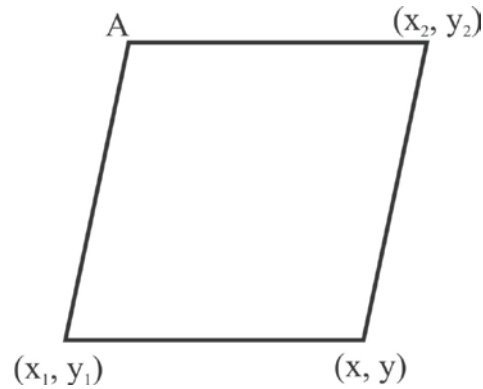
- The midpoint of the line joining (x, y) and (x, y) is

$$\left[\frac{1}{2}(x + x_1), \frac{1}{2}(y + y_1)\right]$$

- X coordinate of $p = x_1 + (x - x_1)x\frac{n}{m+n}$

- Y coordinate of $p = y_1 + (x - x_1)x\frac{n}{m+n}$

Or in another way:

- The coordinates of $p = \left(\frac{mx_2 + nx_1}{m+n} + \frac{my_2 + my}{m+n}\right)$

- In any line not parallel to either axis, the change in y coordinate is the product of the change in x coordinate with a fixed number. In other words change in y is proportional to the change in x.

- Geometrically, the x difference is the horizontal shift and y difference is the vertical shift.

- The constant of proportionality of the change in coordinates of a line is a measure of the slant of the line. It is called the slope of the line

- Slope of the line AB is equal to
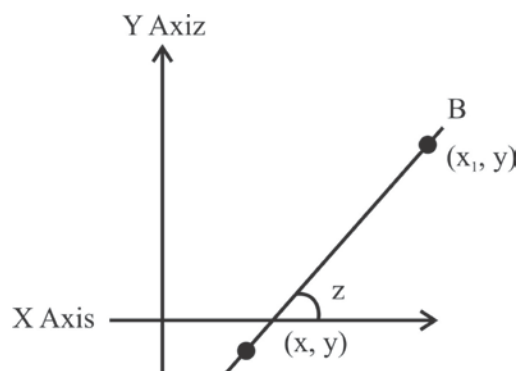
$$\frac{y \text{ difference}}{x \text{ difference}} = \frac{y_1 - y_0}{x_1 - x_0} = Tan\ Z$$

- If slope is a positive number then the line is slanted to right

- If slope is negative then the line is slanted to left

- If the products of slopes at 2 lines $= -1\ m_1 x\ m_2 = -1$.

  Then the lines are intersect perpendicularly
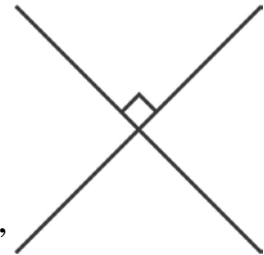
- The equation of the line joining the points (2, 4) and (5, $8 = 0$

- Equation of the line $= y - y_1 = m(x - x_1)$

(x_1, y_1)
Slope = m
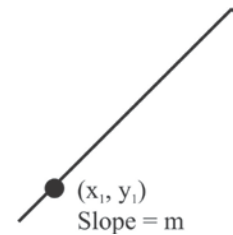
- Equation of the line is in the formula $y = mx + c$. $m = slope$ and $c = y$ value of the point of intersection of the line with y axis

- If the slope of 2 lines are equal then the lines are parallel

- Centroid $= \left(\frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3}\right)$

(x, y)

(x_1, y_1) (x_2, y_2)
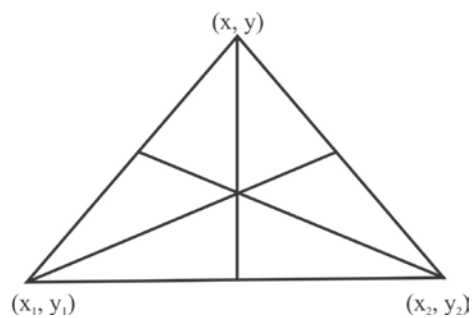
- If (x, y) be any point on the circle and (a, b) is the centre, then equation of circle is $(x - a)^2 + (y - b)^2 = 2^2$

- The circle with centre origin and radius r. The equation of circle is $x^2 + y^2 = r^2$
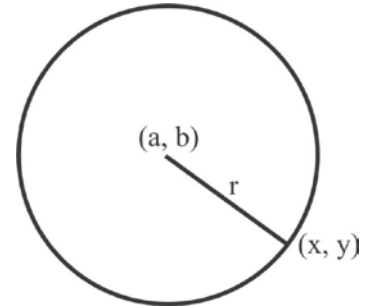
A+ Questions

1. (a) Find slope of the line passing through (5, 10), (6, +2)

   (b) Write the equation of this line

   (c) Write 2 coordinates of another line which parallel to this line

2. (a) Find the coordinates of point A

   (b) Prove that x coordinate of point A is equal to x coordinate of c subtracted from the sum of x coordinates of B and D
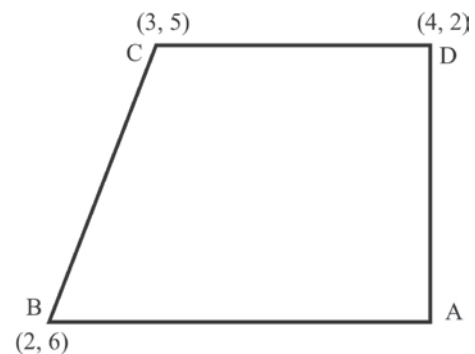
3. (a) Find the coordinates of four the vertices of the parallelogram

   (b) Find the length of the sides of the parallelogram

   (c) Find the slopes of line AD, DC, BC and AB

(d) If coordinates of A is (0, 0) then, what will be the coordinates of other points?
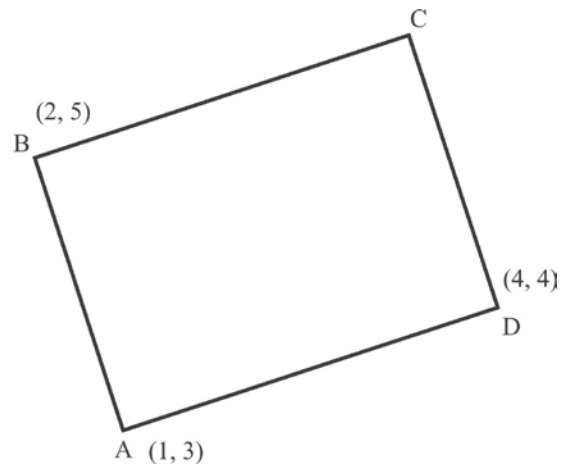
4. In this picture the midpoints of the sides of the large triangle are joined to make a small triangle inside and the midpoints of small triangle is joined to make a very small triangle. Find the coordinates of A, B, C, D, E and F
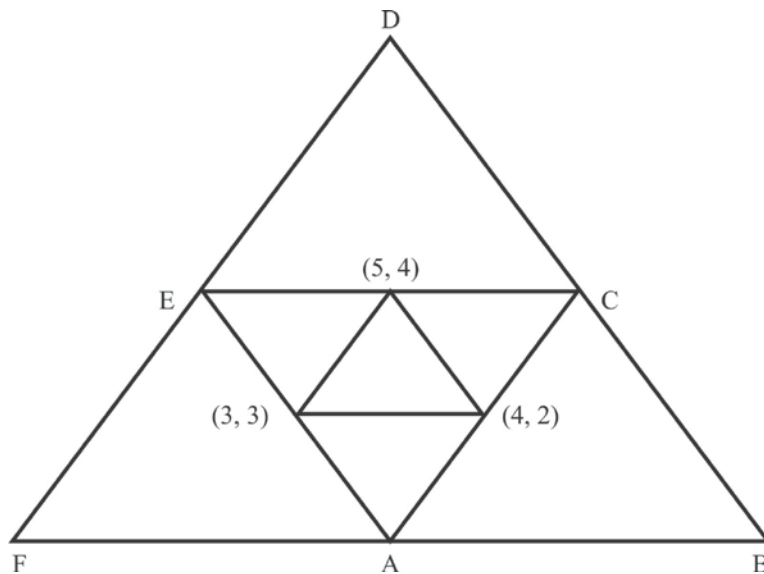
5. AB is the diameter of the circle. Origin is the centre of the circle

(a) Find coordinates of A?

(b) Find the radius?

(c) What is tan x?
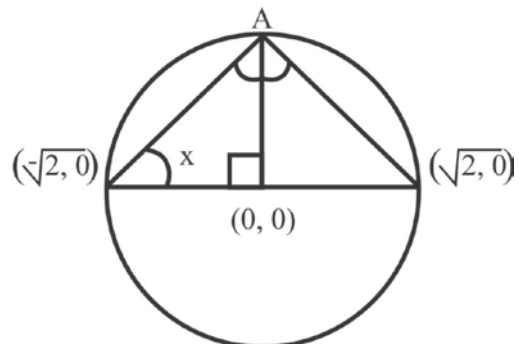
6. The coordinates of the vertices of a quadrilateral are (1, 2), (3, 3), (6, 7), (4, 5). PQRS are the midpoint of quadrilateral ABCD.
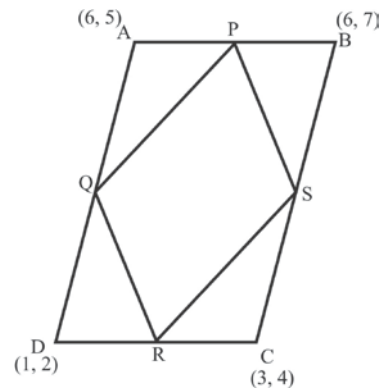
(a) Find the coordinates of midpoints of the sides of quadrilateral

(b) What is the name of quadrilateral formed by joining the midpoints? State your answer?

7. ABCD is a parallelogram A (7, 5), B (3, 2), D (8, 7)

(a) Draw a rough figure

(b) Find coordinate at C

(c) Find out length of side

(d) Find out length of diagonal

8. PQRS are the midpoint of a quadrilateral ABCD.

P (2, 3), Q (4, -5), R (6, 3)

(a) Draw its rough figure and circumcircle

(b) Find out length of side

(c) Find out its Circumcircle

(d) Find out its circumradius

9. A (-7, 4), B (7, 11), C (7, -3) are the 3 vertices of triangle ABC.

(a) Draw a rough figure

(b) Find out length of sides

(c)   Find out area of ΔABC

10.   In ΔABC, A (-3, 4), B (-5, 6), C (3, 12) are the 3 vertices of triangle.

(a)   Draw a rough figure

(b)   Find out length of sides

(c)   Prove its an isolates triangle

(d)   Draw a perpendicular from C to AB, it meets at D, find out the coordinate at D.

(e)   Find out length of CD

(f)   Find out area of ΔABC

11.   (a)   Find out length of OA

(b)   Find out length of OB

(c)   Find out length of OP
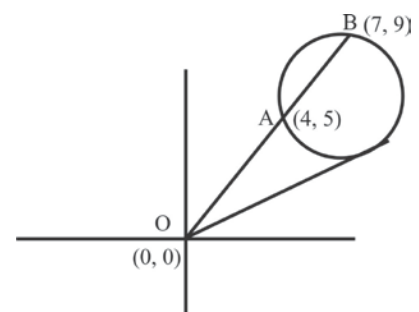
12.   (a)   Mark coordinates (4, 3), (6, 7)

(b)   Find out slope of line

(c)   Is the point (9, 13) on this line?

13.   The radius of a circle is 5 unit. Find coordinate at the centre

(2, 1)
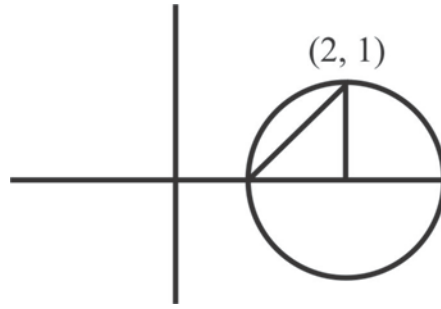
14. Slope of line $AB - \frac{1}{3}, A\,(7-4)B\,('a'-2)$. Find out value of $'a'$

15. Slope of line is $\frac{1}{2}$. It passes through point (1, 5) and it passes through another coordinate (x, 6). Find out value of x.

16. A (3, 5), B (9, 7), C (5, 9) and D (7, 1) are the vertices of the quadrilateral ABCD. Prove that quadrilateral joining the midpoints of the side of it is a parallelogram.

17. (-1. -1) and (2, B) are two points on a line

    (a)   Find the slope of line

    (b)   If (x, y) is a point on this line, write the relation between x and y

    (c)   Write the coordinates of the point at which the line cut the 'y' axis

18. Find the centre and radius of the circle $x^2 + y^2 - 4x - 4y + 4 = 0$

19. (a)   What is the slope of line $2y - 3x = 6$?

    (b)   Write the equation of the line parallel to this line and passing through (3, 3)

20. (a)   Write the equation of the circle with (0, 0) and radius 5

    (b)   Is (3, 4) a point on this circle

    (c)   Find the slopes of the line joining centre and the point (3, 4)

(d)   Write the equation of the tangent to the circle at this point

21.   If the equation of a circle is $x_2 + y_2 = 4$, then

(a)   What is the radius?

(b)   If the x coordinate of a point on the circle is zero. What is y coordinate of that point?

(c)   Write the coordinate of another point on the circle

22.   A (2, 5) and B (a, -3) are joined to get a line AB as in the figure P(4, 6) is the midpoint of AB

(a)   Find the value of a and b

(b)   Equation of line

B
(0, -3)

P
(4, 6)

A
(2, 5)
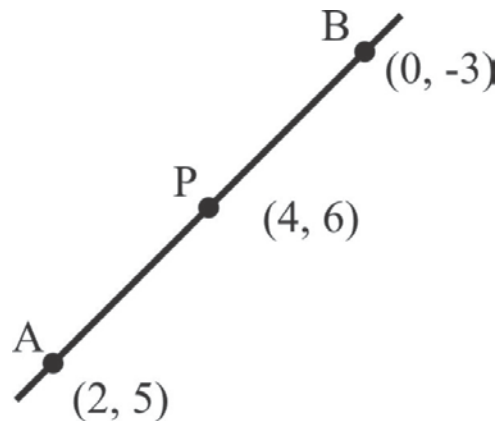
• When $p(x)$ divided by $(ax + b)$, the quotient is $q(x)$ and the remainder is $c.\ px) = (ax + b)x\ q(x) + c$

(a)   When does the value of $p(x)$ equal to c

(b)   What is the remainder when $p(x)$ is divided by $ax + b$. When does $(ax + b)$ became the factor of $p(x)$

• Find the remainder obtained by dividing $x^3 - 6x^2 + 11x + 5$ by $(x - 1).(x + 1)(x - 1)(x + 3), (2x + 1).$ Write   a   third   degree polynomial in which x^2 is a factor

- Prove that $x^2 + 2x + 2$ cannot be written as the product of first degree polynomials

- Find the remainder and quotient obtained by dividing $x^3 - 5x^2 + 7x - 3$ by $(x + 2)$

- Find $p(1)$ in the polynomial $p(x) = x^3 - 4x^2 - 7x + 10$. If $p(x) = (x - 1)x\, q(x)$ then find $q(x)$. Write $q(x)$ as the product of two first degree polynomials

- If $p(x) = x^3 + ax^2 + bx - 3, p(1) = 0, p(2) = 15$ then find a, b. Write $p(x)$ as the product of three first degree polynomials

- $p(x) = (4x^2 - 1)(x + 2)$ write $p(x)$ as the product of first degree factors. Write $p(x)$ in the form of third degree polynomials. What is the remainder obtained by dividing $4x^3 + 6x^2 - x + 2$ by $(x + 2)$. What is the remainder obtained by dividing $4x^3 + 6x^2 - x + 1$ by $(2x - 1)$

- In the polynomial $p(x) = x^2 + ax + b\ P\sqrt{2} - 0, P(3 - \sqrt{2}) = 0$. Write this polynomial after finding a and b.

- Write the second degree polynomial $p(x) = x^2 + n - 6$ as the product of first degree polynomials. Find also the solution of the equation $p(x) = 0$

- For what values of x, the polynomial $2x^2 - 7x - 15$ is equal to zero? Write this polynomial as the product of two first degree polynomials

- Write the polynomial $p(x) = x^2 + 4x + 1$ as the product of two first degree polynomials. Find the solution of the equation $p(x) = 0$

- What number should be added to the polynomial $p(x) = x^2 + x - 1$, so that $(x - 2)$ is a factor of the new polynomial

- What is the smallest natural number k, for which the polynomial $2x^2 + kx + 6$ can be written as a product of two first degree polynomials. Write down the polynomial using k and express it as the product of two first degree polynomials

- The remainder on dividing $p(x) = x^3 - 5x^2 + kx + 19$ $(x - 3)$ is -5.

  a)   What is the number k?

  b)   What is the remainder on dividing $p(x)$ by $(x - 4)$?

  c)   What number should be added to $p(x)$ to get a polynomial for which $(x - 3)$ and $(x - 4)$ are factors

- Find the remainders on dividing

  $9x^3 + 18x^2 - 4x - 10$ by $(3x + 2)$

  Write a third degree polynomial for which $(3x + 2)$ and $(3x - 2)$ are factors

- Method to check whether $(x - 1)$ and $(x + a)$ are factors of a polynomial $p(x)$

  Check whether $(x + 2)$ and $(x - 5)$ are factors of the polynomial $p(x) = x^2 + 7x + 10$

  a) $(x^2 - 1)$ is a factor of the polynomial $ax^2 + bx^2 + cx + d$ prove that $a + c = 0$ and $b + d = 0$

  b)   What first degree polynomial should be added to $3x^3 - 7x^2 + 2x + 3$. Gives a multiple of $(x^3 - 1)$

- Expand $(x-1)(x-b)$. If $x^2 - 7x + 12 = (x-a)(x-b)$ then find $a+b$. Also find ab. Calculate the valves of a, b. Write the factors of $(x^2 - 7x + 12)$. Find the solutions of $(x^2 - 7x + 12)$

- If $p(x) = x^3 - 6x^2 + 11x - 1$ then find $p(1), p(2), p(3)$. Find $p(x) - p(1), p(x) - p(2), p(x) - p(3), p(x) - p(1)$. Write the solutions of $p(x) - p(1) = 0$

- Write the product $(x-1)x(x+1)$

  Find the product of $(x-1), (x+1), (x+2)$

  If the product is $p(x)$ find $p(1), p(-1), p(-2)$

  Write the solutions of the equation $p(x) = 0$

- $p(x)$ is a third degree polynomial $p(1) = p(2) = p(-2) = 0$. Write the factors of $p(x)$. Write the product of the factors in the form of third degree polynomial

- Write the following as the product of first degree polynomials

  1. $x^2 + 7x + 12$ 2. $x^2 + bx + 2$ c. $x^2 - 9x - 22$

  4. $2x^2 + 5x - 3$

- $p(x) = x^{100} + x^{50} + x^{20} + 1$. Can $p(x)$ have first degree factors

- When $p(x) = x^3 - 4x^2 + 5x + 10$ is divided by both $x-2$ and $x-3$ gives the same remainder find the value of k? What is the remainder? Form a polynomial from $p(x)$ so that both $x-2$ and $x-3$ are is factors.

- Test whether $2.8x - 5.6$, a factor of the polynomial $x^2 - 5x + 6$

- The remainder obtained when the polynomial $p(x)$ is divided by $x - a$ is k and when the polynomial $q(x)$ is divided by $x - 9$, remainder is k. Prove that $x - 9$ is a factor of $p(x) + q(x)$

- If $p(x) = 9x^3 + bx^2 + cx + d$ then prove that $p(10) - p(1)$ is a multiple of 9.

- If $-3 - 5$ are the solutions to the second degree equation $x^2 + ax + b = 0$

  a)   Write the polynomial $x^2 + ax + b$ as the product of two first degree polynomials

  b)   Find the value of $'a'$ and $'b'$

- In the polynomial $p(x) = x^2 + ax + b, p(3 + \sqrt{2}) = 0, p(3 - \sqrt{2}) = 0$, write this polynomial after finding a and b.

- When dividing $x^2 + ax + b$ by $(x - 2)$ and $(x - 3)$ the remainder is zero. What are the number a and b.

- In the polynomial $p(x) = x^2 + 6x + k$. If $k = -10$, prove that $p(x)$ can be written as the product of two first degree polynomials.

- If $k = 10$, prove that $p(x)$ cannot be written as the product of two first degree polynomials

- What is the largest number $'K'$ for which $p(x)$ can be written as the product of two first degree polynomials

- If the polynomial $x^3 + bx^3 + cx + d$ can be completely divided by $x + 3$, then prove that $qb + d = 279 + 3c$

- If two O's at the polynomial $p(x) = x^3 - ux^2 - 3x + 12$ are $\sqrt{3}$ and $-\sqrt{3}$ then find its third O

- If 1 and m are O's at the polynomial $p(x) = 2x^2 - 5x + 7$. Find a polynomial whose zeros are $12 + 3$ and $2m + 3$?

- Find the value at a and b if they are the O's at polynomial $x2 + ax + b$

- If a and b are the O's of the quadratic polynomial $f(x) = x^2 + 4x + 3$ find the value at $a^4 b^3 + a^3 b^4$

- If p and q are the O's at the polynomial $f(x) = x^2 - 5x + k$ find the value at k

- Find the O's at the polynomial $f(x) = \sqrt[4]{3x^2} + 5x - \sqrt[2]{3}$ and verify the relationship between the zeros and its coefficients.

- If a and b are O's at quadratic polynomial $kx^2 + 4x + 4$, find the value at k such that?

- Find the value at a and b, if they are the O's at polynomial $x^2 + ax + b$

- What number should be added to the polynomial $p(x) = x^2 + x - 1$ so that $(x - 2)$ is after at the polynomial?

- $x^2 - 4x^2 + ax + b$ is a factor at $x^2 - 4x + 6$ find the numbers a and b?

- Prove that $x^2 + 2x + 2$ cannot be written as the produced at first degree polynomial?

- If $x - 1$ is a factor of $x^3 - kx^2 - x + 2$ find the value of k

- Te at whether $x - 1$ is a factor of $ax^3 + bx^2\ ax - b$ write a third degree polynomial in which $x - 1$ is a factor

a)   Write $p(x) = x^2 + 2 - 6$ as the product of the first degree polynomials

b)   Find the solutions of the equation $p(x) = 0$

STATISTICS

1.   The table shows the weight of 40 students in a class. Find the median

Weight	No. of students
35 – 40	4
40 – 45	8
45 – 50	13
50 – 55	10
55 – 60	5

2.   The table below shows 30 women's sorted according to their hemoglobin level, after blood test.

Haemoglobin	No. of children
12.1	3
12.5	5
12.8	2
13.2	4
13.4	4
13.7	12

3.   The table below shows marks of children's in a class

Marks	No. of childrens
0 – 5	2
5 – 10	6
10 – 15	7
15 – 20	10
20 – 25	15
Total	40

Find median mark

4.   29, 26, 23, 20, 17, 14, 11, 8

a)   Find mean and median

b)   Why mean and median are equal?

5.   The height of 10 students are given below

148, 161, 143, 133, 154, 175, 135, 167, 150, 141

a)   Find mean and median

b)   Avoid most height student and final mean and median

6.   The table below shows children of a class sorted according to their marks in exam:

Marks	No. of children
0 – 10	10
10 – 20	7
20 – 30	8
30 – 40	9
40 – 50	4

Find the median

7.   The table shows the income of the families:

Income	No. of families
1000 – 2000	11
2000 – 3000	15
3000 – 4000	16
4000 – 5000	12
5000 – 6000	8
6000 – 7000	7
7000 – 8000	9

Find the median

8. Find the median of the height of the students 6.5, 6, 5.5, 5, 4.8, 5.2

9. $f, f + d, f + 2d, f + 3d, f + 4d, f + 5d, f + 6d, f + 7d, f + 8d$ is an arithmetic sequence

   a) Find the mean

   b) Prove that the set of number in the arithmetic sequence the mean and the median are equal

10 The table shows the daily wages of the workers in a company

Daily wages	No. of workers
400 – 500	6
500 – 600	7
600 – 700	10
700 – 800	9
800 – 900	5
900 – 1000	4
Total	41

   a) Which term is the median?

   b) Find the common difference

   c) What is the 14th term?

   d) Find the median?

11. The table below shows the weight of 25 babies.

Weight	No. of babies
2.100	2
2.300	4
2.500	5
2.700	3
2.800	6
3.000	5

12. The table below gives the temperature during May 2016 in various *countries* in India.

Countries	Temperature
Kerala	33^0c
Karnataka	23^0c
Tamil Nadu	34^0c
Rajasthan	42^0c
Gujarat	38^0c
Bengal	29^0c
Bihar	30^0c
Goa	25^0c

Calculate mean and median temperature?

13. The table shows the employees in *an* office sorted according to their wages

Daily wages	No. of employees
1000	5
1500	7
2000	6
2500	3
3000	4
3500	2
4000	8
4500	5
5000	10

Calculate mean and median?

14. The table below gives the income tax paid by workers in an office in a year

Income tax	No. of workers
1500 – 2500	8
2500 – 3500	10
3500 – 4500	15
4500 – 5500	17
5500 – 6500	19
6500 – 7500	6

Calculate median income tax paid?

15. Find the median of 30, 45, 72, 84, 90, 101, 23, 18, 50, 10

16. The table shows same households sorted according to their usage of electricity

Electricity usage (unit)	No. of households
100 – 110	5
110 – 120	8
120 – 130	10
130 – 140	3
140 – 150	6

Calculate the median usage of electricity?