ജില്ലാ വിദ്യാഭ്യാസ പരിശീലന കേന്ദ്രം

ആലപ്പുഴ

(DIET)

നിറകതിർ 2021- ഗണിതം

SSLC 2021 ഊന്നൽ മേഖല അടിസ്ഥാനമാക്കി തയ്യാറാക്കിയ പരീക്ഷാ സഹായി

DIET ALAPPUZHA

NIRAKATHIR 2021

ആമുഖം

പത്താംതരം വിദ്യാർത്ഥികളുടെ പഠനത്തിന്റെ ഭാഗമായ സംശയ നിവാരണ പ്രവർത്തനങ്ങളുമായി ബന്ധപ്പെട്ട് ,കോവിഡ് മാനദണ്ഡങ്ങൾ പാലിച്ചുകൊണ്ടുതന്നെ ജില്ലയിലെ വിദ്യാലയങ്ങൾ സജീവമായിരിക്കുകയാണ്.ആലപ്പുഴ ഡയറ്റ് നടത്തിയ വിദ്യാലയ സന്ദർശനങ്ങളുടെ ഭാഗമായി അധ്യാപകർ,രക്ഷിതാക്കൾ, ജനപ്രതിനിധികൾ തുടങ്ങിയവരുമായി നടത്തിയ ചർച്ചയിൽ പത്താംതരം പൊതു പരീക്ഷയുടെ റിവിഷൻ പ്രവർത്തനങ്ങളെ സഹായിക്കുന്ന ഒരു വായനാ സാമഗ്രിയുടെ ആവശ്യകത പരക്കെ ഉന്നയിക്കപ്പെടുകയുണ്ടായി .പൊതു പരീക്ഷയിൽ പ്രത്യേക ഊന്നൽ നൽകേണ്ട പാഠഭാഗങ്ങൾ പൊതുവിദ്യാഭ്യാസ വകുപ്പ് നിർദ്ദേശിച്ചിട്ടുമുണ്ട്. ഈ പശ്ചാത്തലത്തിലാണ് നിറകതിർ 2021, എസ്.എസ്.എൽ.സി റിവിഷൻ സഹായി ആലപ്പുഴ ഡയറ്റ് തയ്യാറാക്കി പുറത്തിറക്കുന്നത്.

പൊതുവിദ്യാഭ്യാസ വകുപ്പ് നിർദ്ദേശിച്ചിട്ടുള്ള വിവിധ വിഷയങ്ങളുടെ ഊന്നൽമേഖലകളാണ് ഇതിലെ പ്രതിപാദ്യം. വിദ്യാർത്ഥികൾക്ക് ഉന്നത വിജയം കരസ്ഥമാക്കുന്നതിന് ഇത് ഉപകരിക്കും. ഊന്നൽ മേഖലകൾ നിശ്ചയിച്ചിരിക്കുന്നതു തന്നെ ഉപരിപഠനത്തിന് സഹായകമായ പാഠഭാഗങ്ങളെ മുൻനിർത്തിയാണല്ലോ? എന്നിരുന്നാലും പാഠഭാഗങ്ങൾ പൂർണ്ണമായി മനസ്സിലാക്കാനും പൊതു പരീക്ഷക്കു സഹായകമായി ഈ ഊന്നൽ മേഖലകൾ കേന്ദ്രീകരിച്ചുള്ള പഠനം നിർവ്വഹിക്കാനും ശ്രദ്ധിക്കണം.

വളരെ കുറഞ്ഞ സമയത്തിനുള്ളിൽ തന്നെ വ്യത്യസ്ത വിഷയങ്ങളിൽ ഈ വായനാ സാമഗ്രി തയ്യാറാക്കാൻ കഴിഞ്ഞത് ജില്ലയിലെ അധ്യാപകരുടെ ആത്മാർത്ഥമായ പരിശ്രമം കൊണ്ടു മാത്രമാണ്. ഡയറ്റിൻ്റെ എല്ലാ പ്രവർത്തനങ്ങളിലും ജില്ലയിലെ അധ്യാപകരും, വിദ്യാഭ്യാസ പ്രവർത്തകരും നൽകി വരുന്ന പിന്തുണ ഇതിൻ്റെപ്രവർത്തനത്തിലും ഉണ്ടായിട്ടുണ്ട്. പത്താംതരം പൊതു പരീക്ഷയെ മികച്ച ആത്മവിശ്വാസത്തോടെ അഭിമുഖീകരിക്കാൻ

നിറകതിർ 20 –21 സഹായിക്കുമെന്ന് പ്രതീക്ഷിക്കുന്നു.ഈ സംരംഭത്തെ സഹായിച്ച എല്ലാവർക്കും നന്ദി.

മിനി ബഞ്ചമിൻ
പ്രിൻസിപ്പൽ ഇൻ ചാർജ്ജ്
ഡയറ്റ് ആലപ്പുഴ

എം. അജയകുമാർ
സീനിയർ ലക്ചറർ
ഫാക്കൽറ്റി ഓഫ്
ഐ.എഫ്.ഐ.സി
ഡയറ്റ്
ആലപ്പുഴ
(കോഡിനേറ്റർ)

ശില്പശാലയിൽ പങ്കെടുത്തവർ

1. ജയകുമാരപ്പണിക്കർ, ഡയറ്റ് , ആലപ്പുഴ
2. എസ്. മോഹൻകുമാർ, ആർ.വി.എസ്.എം എച്ച്.എസ്സ്.എസ്സ്, പ്രയാർ
3. ശശി.എസ്സ്, ഗവ.ബോയ്സ് എച്ച്.എസ്സ് എസ്സ്, കായംകുളം
4. കെ.വി. രഘുദാസ്, ഗവ. വി.എച്ച്.എസ്സ്.എസ്സ് ചുനക്കര
5. സന്തോഷ്.കെ, എസ്.വി.എച്ച്.എസ്സ്,എസ്സ്, കായംകുളം

ARITHMETIC SEQUENCE

POINTS TO REMEMBER

1. n^{th} term = an+b

a= common difference, b= first term - common difference

2. Common Difference = $\frac{Difference\ between\ two\ terms}{Difference\ of\ its\ positions}$

3. General form of an Arithmetic Sequence

f, f+d, f+2d, ... f+(n-1)d

4. Sum of n terms

$S_n = \frac{n}{2}(2a+(n-1)d)$

$S_n = \frac{n}{2}(x_1+x_n)$

5. Sum of first n natural numbers $S_n = \frac{1}{2}n(n+1)$

6. If the number of terms in an arithmetic sequence is odd, then sum of terms = middle term x number of terms

7. Sum of consecutive 'n' odd numbers from one = n^2

8.Sum of consecutive 'n' even numbers from two = n(n+1)

Questions:

I. Choose the correct answer and fill the blanks. 1 score each

1.The first term and common difference of an arithmetic sequence are equal. If its first term is 5, then its 6^{th} term is -----------(5, 11,30,56)

2.The algebraic form of an arithmetic sequence is 5-3n. Its common difference is .... (8,2,-3,1)

3. If 1+2+3+...+10= 55, then 2+4+6+...+20=.......(55,110,550,100)

4.The 13^{th} term of an arithmetic sequence is 25.Then the sum of first 25 terms of this sequence is ....(625,325, 100,450)

5. The 10^{th} and 15^{th} terms of an arithmetic sequence are 60 and 80 respectively, its common difference is ....(20,10,15, 4)

6.The algebraic form of an arithmetic sequence is $\frac{1}{2}n+\frac{1}{3}$, its first term is ....

($\frac{1}{2}$, $\frac{1}{3}$, $\frac{5}{6}$, $\frac{2}{6}$)

7.The reminder when each term of the arithmetic sequence 3n+1 is divided by 3 is ....(3,1,0,5)

II. Answer the following .2 scores each.

1.The algebraic form of an arithmetic sequence is 5n-3.

a) What is its 10^{th} term?

b) Is 98 a term in this sequence?

2.Consider the arithmetic sequence 4,7,10,,...

a) Write its algebraic form.

b) What is its 25^{th} term?

3.Consider the arithmetic sequence 3,7,11,....

a) Write its algebraic form?

b) Is 101 a term in this sequence?

4. Consider the arithmetic sequence -98, -95, -92,....

a) What is its common difference?

b)Write its algebraic form.

III Answer the following , 3 scores each.

1. The first term of an arithmetic sequence is 4. Its 8^{th} term is 25.

a) What is its common difference?

b) Write its algebraic form.

c) Find the sum of its first 15 terms.

2.The sum of First and 20^{th} terms of an arithmetic sequence is 42.

a) What is the sum of its 3^{rd} and 18^{th} terms?

b) Write any pair of terms having the same sum.

c).What is the sum of its first 20 terms?

3.The sum of first 13 terms of an arithmetic sequence is 234.

a) What is its 7^{th} term?

b)If its common difference is 3 , what is its first term?

c)Write the algebraic form of this sequence.

4.The algebraic form of an arithmetic sequence is 2n-5

a)What is its first term?

b) Is 0 a term in this sequence?

c)What is the first positive number in this sequence?

5.If 2+4+6+8+......50=650 Find the following

a)1+2+3+....+25

b) 1+3+5+...+49

c) 5+7+9+....+53

IV .Answer the following 4 scores each

1.Consider the arithmetic sequences 4,7,10,.....and 17,19,21,....

a) Write the algebraic form of each sequence

b) Is there any term common to both the sequences?

c) If yes , at which position did the common term occur?

d) What is the common term?

2.The algebraic expression of an arithmetic sequence is 8n+11

a) Write the common difference of the sequence?

b)What is the reminder got when each term of this sequence is divided by the common difference?

c) Is 101 a term of this sequence? Why?

3. Consider the arithmetic sequence 6,10,14,....

a) Write its algebraic form.

b) What is its 20th term?

c) Find the sum of its first 20 terms?

d) What is the difference between the sum of its first 20 terms and sum of next 20 terms?

4. The 10th term of an arithmetic sequence is 23 and its 23rd term is 10

a) What is its common difference?

b) what is its first term?

c) What is its 33rd term?

d) In what position did the first negative number occur in this sequence?

5. Observe the pattern and answer the questions below 5 score

1

2, 3

4, 5, 6

7 8 9 10

....

....

a)Write two more lines of the pattern

b) What is the last term in the 9th row?

c)What is the first number in the 10th row?

d) Find the sum all terms from 1st row to the tenth row?

SECOND DEGREE EQUATIONS

POINTS TO REMEMBER

* General form of a second degree equation is $ax^2+bx+c=0$

Identitie u ed to olve econd degree equation

* $(a+b)^2=a^2=2ab+b^2$

* $(a-b)^2=a^2-2ab+b^2$

* $(x+a)(x-a)=x^2-a^2$

completing the quare

The equations in the form $x^2+px=m$, can be solved by completing the square as follows

$x^2+px=m$

add $\left(\frac{p}{2}\right)^2$ on both ide

$x^2+px+\left(\frac{p}{2}\right)^2=m+\left(\frac{p}{2}\right)^2$

It becomes

$\left(x+\frac{p}{2}\right)^2=k^2$ from that we can solve for x

Method to form a econd degree equation

3 more than a number → $x+3$
7 less than a number → $x-7$
4 times a number → $4x$
2 more than 3 times a number → $3x+2$
a number and it reciprocal → x, $\frac{1}{x}$
consecutive natural numbers→ x, $x+1$
consecutive odd/even numbers → x, $x+2$
perimeter of a rectangle → $2(l+b)$ l -length, b -width
area of a rectangle → lb, l -length, b -width
area of square → a^2 ,a -one side
pythagorus theorem → $base^2+altitude^2$ =hypotenuse²
time= $\frac{distance}{speed}$
speed = $\frac{distance}{time}$

Questions
1. When one side of a square is decreased by 7cm , the area becomes 625 sq.cm
   1. Take the side of first square as x, form the equation
   2. Find the side of the original square
2. A square is cut off from a square of side 26cm. The area of the remaining part is 576 sq.cm
   1. Take the side of small square as x, form the equation
   2. Find the value of x
3.. A square garden has 2m wide path all around it. The total area of the garden and path is 1225sq.m.
   1. Take the side of the garden as x, form the second degree equation
   2. Find the value of x
4.A 36cm long rod is bent to form a right triangle. Its hypotenuse is 15cm long
   1.Take the small side as x, form the second degree equation
   2. Find the lengths of the perpendicular sides

5.The product of the digits of a two-digit number is 15. If 18 is subtracted from the number, then the digits are interchanged.

1 Take the digit in the 10' place a x, find the digit in the unit place

2. Write the number

3. Write the number when the digits are interchanged

4. Find the first number

6.If 3 is added to the product of two consecutive multiples of 6, we get 435

1. Take the first number as x, write the second number

2.Form the equation

3.Find the numbers

7. The terms of an arithmetic sequence with common difference 3 are natural numbers

1. Take one term as x, write the next term

2. If the sum of the reciprocals of these terms is $\frac{3}{20}$, then write the terms ?

8. 7,11,15... ... is an arithmetic sequence

1. Write its algebraic form.

2. Write the algebraic form of the sum of first n terms .

3.. If the sum of the first n terms of this sequence is 1375, find n ?

9 The di tance between the oppo ite corner of a rectangular field i 26m The length of thi field is 4 metres more tham 2 times its width.

1. lif the width is taken as x, find its length

2.. Find the area of the field ?

3. What is the cost of tiling the field at the rate of ₹430 per square centimetre?

10. To complete a work a man need 10 hours more than the time taken by a boy to complete it. They together take 12 hours to complete the same work.

1 . Taking the time taken by the boy as x, find time taken by the man ?

2. How much work does each of them complete in 1 hour ?

3. Find the work done by them in 1 hour and form the equation.

4. How much time does the boy take to complete the work ?

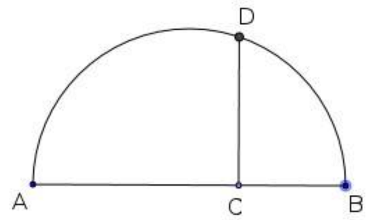
11. Some students are decided to donate ₹ 2400 to disaster relief fund. But 4 students have not given the money on time. So the remaining students have to give ₹50 more to complete the collection

1. Taking the total number of students as x, find the amount given by one student?

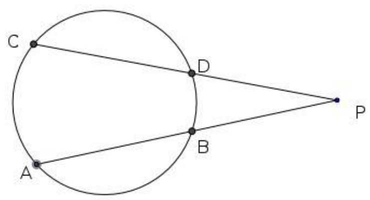
2. When 4 students are decreased , what is the amount given by one student?

3. Form the equation and find the number of students who have given the donation ?

12. In the figure AB is the diameter CD =12 cm, and length of AC is 15cm more than the length of BC. Find the area of the emicircle



13. In the figure chords AB and CD are extended to meet at P . If CD=2cm,
PB=3 cm and AB=5cm Find PD?



CIRCLES and TANGENTS

POINTS TO REMEMBER

* Angle in a semicircle is right.
* If the angle formed at the point where the lines drawn from the end points of a diameter meet,
  is acute then the point is outside the circle
  is right then the point is on the circle
  is obtuse then the point is inside the circle.
* The angle made by any arc of a circle on the alternate arc is half the angle made at the centre.
* All angles made by an arc on the alternate arc are equal, a pair of angles on alternate arcs are supplementary.
* Opposite angles of a cyclic quadrilateral are supplementary.
* PA x PB= PC x PD
* PA x PB= PC^2

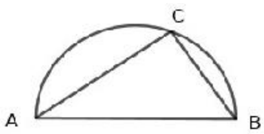
TANGENTS

POINTS TO REMEMBER

*The tangent at a point on a circle is perpendicular to the diameter through that point.
*In a circle, the angle between the radii through two point and the angle between the tangent at these points are supplementary.
* In a circle, the angle between a chord and tangent at either end
is half the central angle of the chord.
*In a circle, the angles which a chord makes with the tangents at its ends on any side are equal to the angle which it makes on the part of the cirle on the other side.
*The tangents to a circle from a point are of the same length.
*In a quadrilateral formed b y the tangents at four points on a circle, the sum of the opposite sides are equal.

Choose the correct answer from the bracket

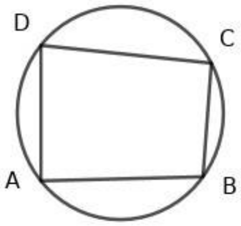
1)



In the picture, AB is the diameter of the semicircle.What is the measure of < ACB?

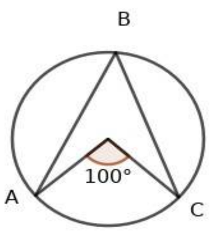
[90^0,60^0, 30^0]

2)



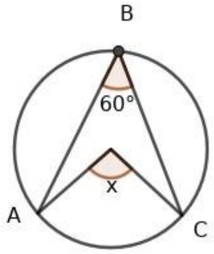
What is the measure of <A+<C?
[<180^0, >180^0, 180^0]

3)



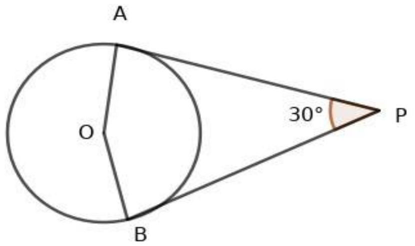
In the picture <AOC=100^0 .Measure of <ABC is ?
[200^0, 80^0, 50^0]

4)



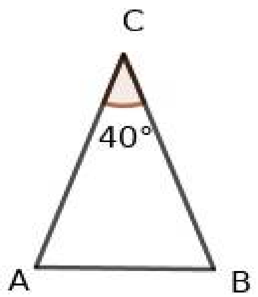
In the picture <ABC= 60^0. What is the value of x?
[30^0, 120^0, $90^{0]}$

5)



In the picture PA and PB are tangents to the circle from the point P. If <APB= $30^{0,}$, what is the measure of <AOB?
[60^0, 180^0, 150^0]

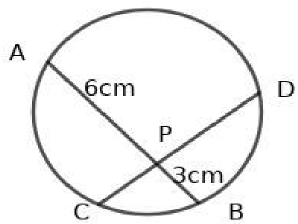
6)



A circle is drawn with AB as diameter .Where will be the vertex C?

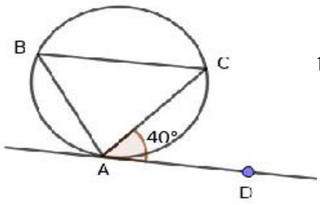
[on the circle, inside the circle, outside the circle]

7)



In the circle, chords AB and CD intersect at P. If PA= 6cm, PB=3cm. Then PC x PD is ?
[9cm, 18cm, 4.5cm]

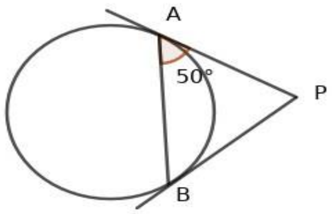
8)



In the picture , AD is a tangent at a point A on the circle.What is the measure of <ABC?

[40^0, 140^0,20^0]

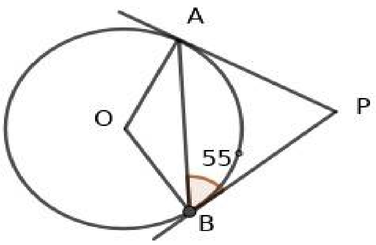
9)



In the figure PA and PB are tangents to the circle from the point P.If <PAB= 50^0. what is the measure of <PBA?

[50^0, 25^0, 80^0]

10)



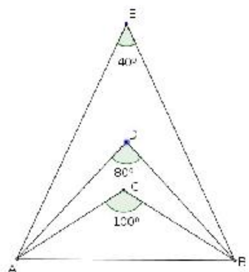
In the figure PA and PB are tangents to the circle from the point P.

If <PBA= 55^0, what is <AOB?

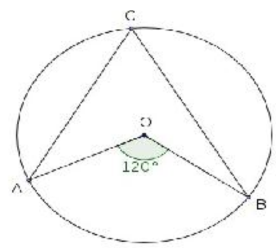
[55^0, 110^0, 125^0]

11)Suppose we draw a circle with AB as diameter in the given picture. Find whether the points C,D,E are inside, outside or on the circle ?

Hint-Angles made by line joining from the ends of diameter

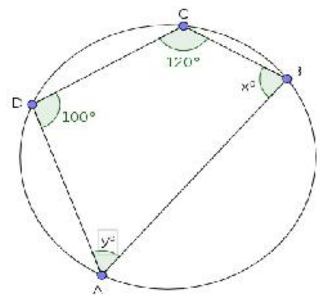


12) In the figure find <ACB ?



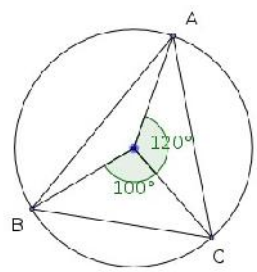
Hint-Relation between central angle angle
angle in the alternate arc

13) Find the values of x and y in the figure ?



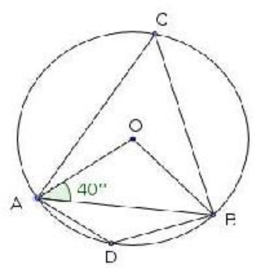
Hint- Opposite angles of cyclic quadrileterl.

14)In the figure, find the angles of triangle ABC?



Hint- Relation between central angle and
angle in the alternate arc.

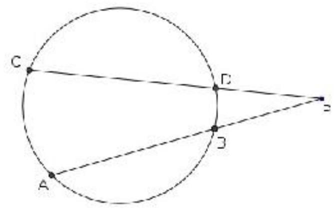
15)In the figure find the measures of <AOB, <ABO , <ACB and <ADB ?



Hint- Angle sum property, relation between central angle
and angle in alternate arc, opposite angle of cyclic
quadrilateral

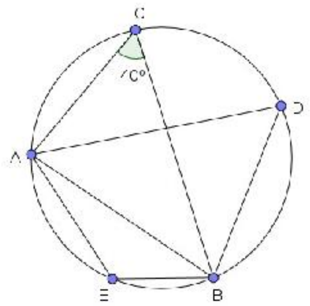
16) In the figure chords AB and CD are extended to meet at P. If PA=9cm PB= 4cm,PC=12cm ,then find the length of PD ?

Hint- PA x PB= PCx PD



17)In the figure find <AEB and <ADB ?

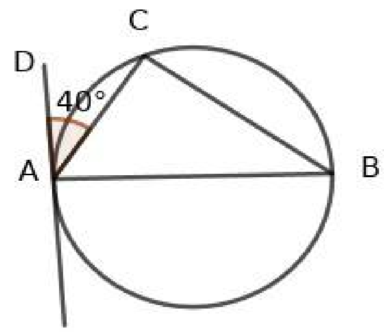
Hint- Angles in the same arc, opposite angles of cyclic quadrilateral



18)In the figure AB is diameter of the circle and AD is a tangent at A. If <DAC=40^{0}, find

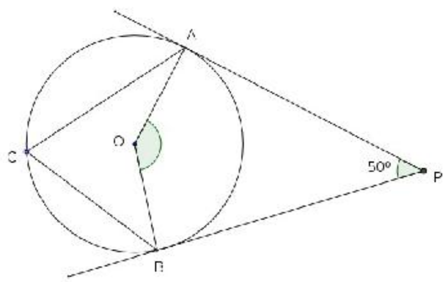
(1)<ACB
(2) <CAB
(3)<ABC

Hint- angle in semicircle, angle between chord and tangent is equal to angle made by the chord on the other side,angle sum property in a triangle



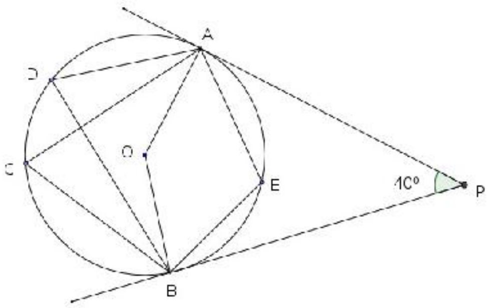
19)n the figure PA and PB are tangents .
If <P=50°, then find <AOB and <ACB ?

Hint the angle between the radii through two points and angle between the tangents at these points are supplementary, relation between central angle
angle in the alternate arc.



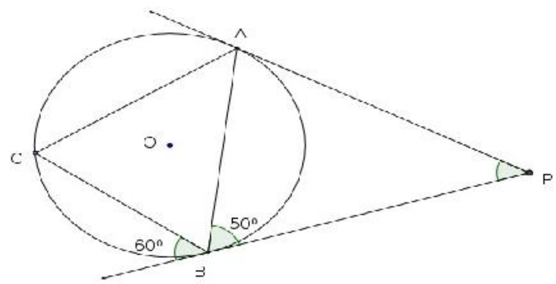
20)In the figure PA and PB are tangents to the circle from the point P.
If <P=40° , then find

1.<AOB
2.,<ACB
3. <ADB
4.<AEB



Hint-the angle between the radii through two points and angle between the tangents at these points are supplementary, relation between central angle angle in the alternate arc, opposite angles of cyclic quadrilateral

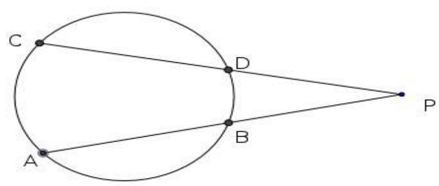
21) In the figure PA and PB are tangents . .AB is a chord, <PBA=60° ., find angles of triangle ABC ?



Hint-The angles which a chord makes with the tangents at its ends are equal to the angle which it makes on the part of the circle on the other side.

22) In the figure chords AB and CD are extended to meet at P. PB=6cm, AB=4 cm and PC=12 cm, find

1. Length of PA ?
2. Length of PD ?



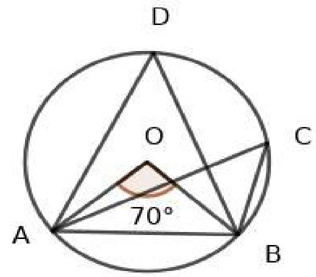
Hint- PAx PB= PC x PD

23)In the figure O is the centre of the circle and <AOB= 70^0

Find (1) <ADB

(2) <ACB

Hint- relation between central angle and angle in the alternate arc.

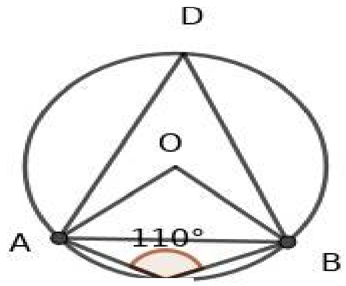


24) In the figure O is the centre of the circle and <ACB=110^0

Find (1) <ADB

(2) <AOB

Hint-Opposite angles of cyclic quadrilateral, relation between central angle and angle in the alternate arc.



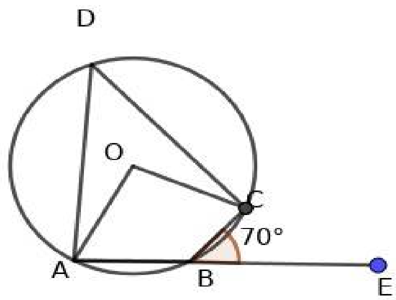
25) In the figure <CBE= 70^0

Find(1) <ABC

(2) <ADC

(3)<AOC

Hint-linear pair,opposite angles of cyclic quadrilateral,relation between central angle and angle in the alternate arc.



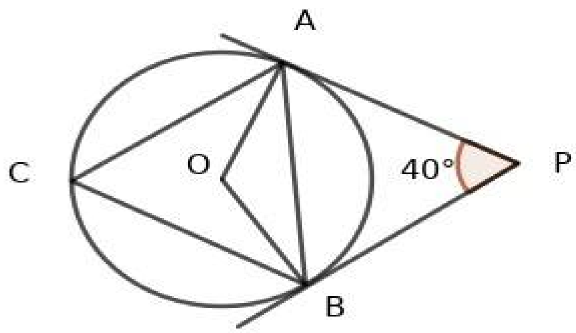
26) In the picture PA and PB are tangents to the circle from the point P.If <APB= 40^0

Find(1) <PAB

(2)<OAB

(3)<AOB

(4)<ACB



Hint-Equal tangents,Angle between radius and tangent, angle between the radii through two points and angle between the tangents are supplementary, relation between central angle and angle in the alternate arc

27) In the circle chords AB and CD intersect at P.

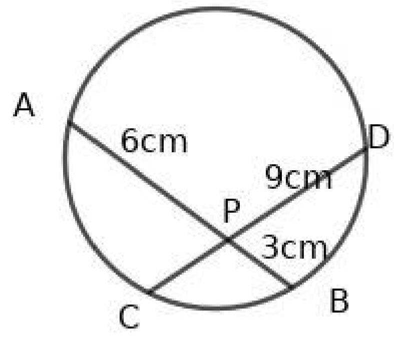
PA= 6cm, PB=3cm,PD= 9cm

Find(1) AB

(2) PC

(3)CD

Hint- PA XPB= PC x PD



28) In the circle, chords AB and CD intersect at P.

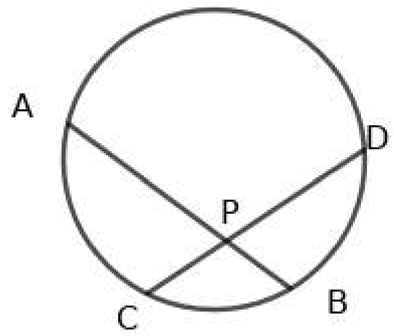
If AB= 7cm, PB= 3cm, PC= 2cm.

Find (1) PA

(2) PC

(3) CD

Hint- PA x PB= PC x PD



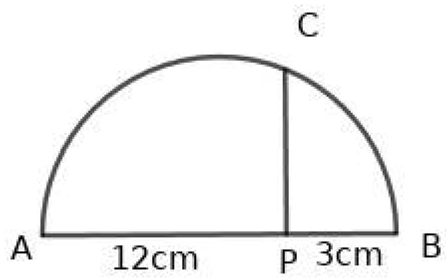
29) In the figure AB is the diameter of the semicircle and PC$\perp$ AB.

If PA= 12cm, PB= 3cm , find

(1) length of PC

(2) the area of the square with PC as one side

Hint- PA X PB= PC^2



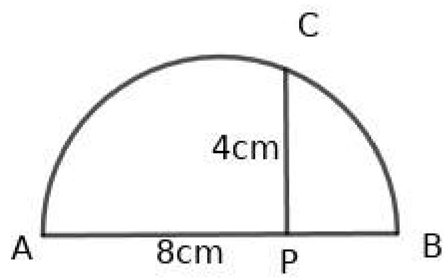
30) In the figure AB is the diameter of the semicircle and PC$\perp$ AB

If PA= 8cm , PC=4cm

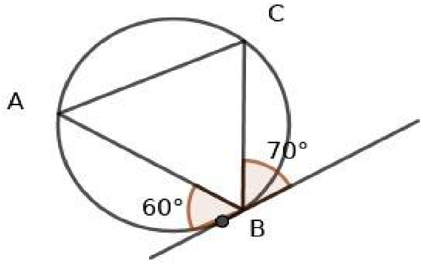
(1) length of PB

(2) radius of the semicircle

Hint- PAx PB= PC^2

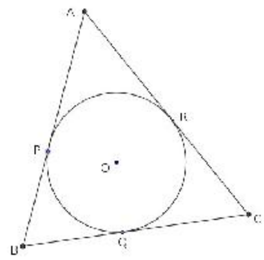


31) In the figure the tangent at B on the circle make angle 60^0 and 70^0 with ide AB and BC of triangleABC. Find angles of ΔABC?



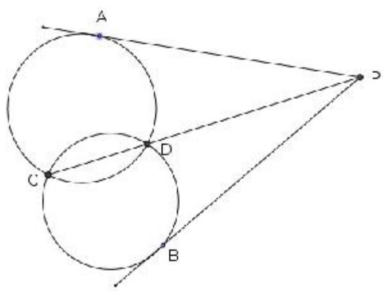
Hint-The angles which a chord makes with the tangents at its ends are equal to the angle which it makes on the part of the circle on the other side.

32)In the figure sides of triangle ABC are tangents of the circle. If AP= 2cm, BQ=3 cm and RC= 2.5 cm, then find the perimeter of the triangle?



Hint- tangents from a point outsde the circle are equal

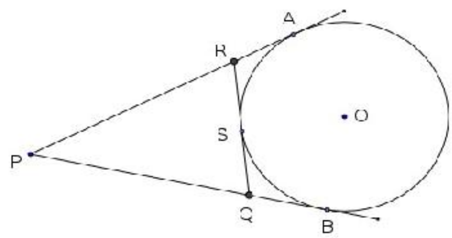
33)In the figure the common chord CD of the cirles is extended to meet at P. PA and PB are tangents to the circles. Prove that PA = PB ?



Hint- PA^2= PCx PD

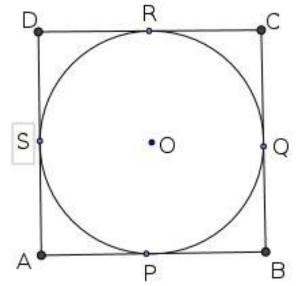
PB^2 = PCx PD

34)In the figure O is the centre of the excircle of triangle PQR. .PA and PB are tangents to the circle. Prove that Perimeter of triangle PQR = PA+PB?



Hint- tangents from a point outside the circle

35)n the figure sides of quadrilateral ABCD are tangents of the circle

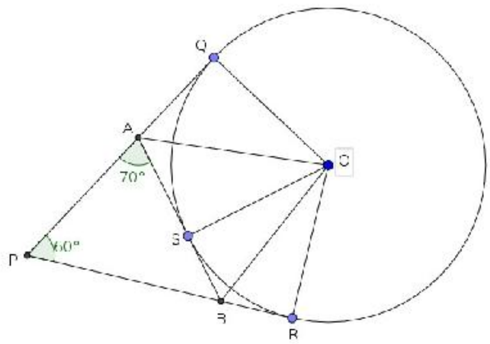


1.Prove that AB+CD=AD+BC

2. If AB=10 cm , BC= 8 cm, DC= 7 cm
then find the length of AD ?

Hint- tangents from a point outside the circle.

36)In the figure O is the centre of the excircle of triangle PAB. PQ, PR, AB are tangents of the circle. <APB=60°, <PAB=70° .
Find the angles of triangle OAB.



Hint- ΔOQA , ΔOSA are equal

let <AOQ=x

Therefore <OAQ= 90-x

<OAS= 90-x

70+90-x+90-x= 180

2x= 70

x= 35

<OAS= 90- 35= 55

<OAB=55

similarly <OBS= 65

<OBA= 65

<AOB= 180-(55+65)

=180-120=60

POINTS TO REMEMBER FOR CONSTRUCTION

I. Construction of triangle with given angles and circum radius

1. Draw circle with given radius.
2. Draw a radius and draw central angles of double the measures of given angles.
3. Join the ends of the radii and complete the triangle.

QUE 1. Draw a triangle of angles 50^0 and 60^0 and circumradius 3cm.

2. Draw a triangle of angles 45°and 65° and circumradius 3.5 cm.

II . Construction of a square having same area as the given rectangle.

1. Draw rectangle of given measures.
2. Extend the length to the measure equal to the breadth.
3. Draw the perpendicular bisector of this line.
4. Draw a semicircle with this line as diameter.
5. Draw a perpendicular from the point of division of length and breadth
6. Using this perpendicular distance draw the square.

Ques 1. Draw a rectangle of area 12sq.cm and construct a square of area equal to the area of the rectangle.

Ques 2. Draw a rectangle of area 18sq.cm and construct a square and an isosceles triangle of area equal to the area of the rectangle.

Ques 3. Draw a rectangle of length 6cm and width 4cm and construct a square of area equal to the area of the rectangle.

III.(a) Construct a square of area 15sq.cm.

Hint. 1. Find the factors of 15

2.Draw a rectangle with these factors as sides.

3. Construct square having same area as the rectangle.

III.(b) Constructing a square without drawing a rectangle.

1. Find the two factors of the number showing the area.
2. Draw a line of length equal to the sum of these factors and divide it the measure of the factors.
3. Draw a semicircle with this line as diameter.
4. From the point of division draw a perpendicular to meet the semicircle.
5. Draw square with this perpendicular length as one side.

Ques 1. Draw a square of area 13sq.cm.

IV. Construct of a rectangle having the same area of the given square and one specified side.

1 Draw line PB with length of the pecified length of the rectangle

2. Draw a semicircle with PB as diameter.

3. Draw a right triangle PCB in this semicircle with one side equal to the side PC of the square.

4..Draw a circle with other side BC of the triangle as diameter

5.PA x $PB=PC^2$

Ques 1). Construct a rectangle of one side 7cm and area equal to the area of square of side 5cm.
Ques 2).Construct a rectangle of one side 7cm and area equal to the area of square of side 6cm.

III. Drawing a tangent at a point on the circle.

1. Draw a circle with given radius
2. Draw one radius
3. Draw a perpendicular to the radius through its endpoint.

Ques 1). Draw a circle of radius 2.5cm. Mark a point P on it and draw tangent at this point.

IV. Construction of a triangle with all its sides touching a given circle

1. Draw a circle with given radius
2. Draw central angles measuring the supplementary angles of the angles of the triangle
3. Draw perpendicular through the endpoints of the radii
4. Complete the triangle,

Ques 1. Draw a circle of radius 3cm. Draw a triangle of angles 50°,60° ,70° with all its sides touching the given circle.
Ques 2) Draw a circle of radius 2cm. Draw a triangle of angles 65° ,75° with all its sides touching the circle.

V. Construction of tangents to a circle from a point outside

1. Draw circle with given radius
2. Join the centre of the circle to the point outside
3. Draw a circle with this line as diameter.
4. Mark the points where this circle touches the given circle
5. Join these points to the point outside.

Ques 1. Draw a circle of radius 3.5cm. Mark a point P 10cm away from the centre. Draw tangents from P to the circle and measure its length
Ques 2). Draw a circle of radius 3cm. Mark a point M 8cm away from the centre. Draw tangents from M to the circle and measure its length.

STATISTICS

POINTS TO REMEMBER

*The mean of set of values is got by dividing its sum by the number of values

ie, Mean $\frac{(x_1+x_2+x_3+\ldots+x_n)}{n}$

* If the number of values 'n' is an odd number then its median is got by arranging the terms in ascending or descending order and take the $\frac{n+1}{2}$ th term

*If 'n' is even , then median is the average of $\frac{n}{2}$ th and $\frac{n+1}{2}$ th terms

1. The temperature of the days in a week is $31^0, 28^0, 30^0, 29^0, 32^0, 27^0, 33^0$,

find its mean and median

2.. The income of seven employees in a week is **3500, 2100, 2500, 2300,2300, 2200, 33003.**

Find its mean and median.

3.Find the mean and median of first 100 natural numbers?

Sum= $\frac{n(n+1)}{2}$

= $\frac{100x101}{2}$

=50x101= 5050

mean = $\frac{\text{sum of numbers}}{\text{total number}}$

= 5050/100=50.5

mdian= $\frac{\text{50 th number+ 51 th number}}{2}$

= $\frac{50+51}{2}$

= 101/2=50.5

3)Find the median of 50 terms of the arithmetic sequence $x_n = 2n+3$?

$$\text{Median} = \frac{25^{th}\text{ term} + 26^{th}\text{ term}}{2}$$

$$= \frac{x_{25} + x_{26}}{2}$$

$$= \frac{(2\times 25+3) + (2\times 26+3)}{2}$$

$$= \frac{53+55}{2}$$

$$= 54$$

4)The daily wages of employees in a factory is given in the table. Find its median

Daily Wages	Number of Employees
350	2
400	3
500	4
600	5
650	3
700	2
800	1

5). The daily wages of employees in a factory are given in the table. Find the median income.

Daily wages	Number of employees
450	2
500	3
550	5
600	8
650	6
700	5
750	1

6) Weights of students in a class are given below

Weights(Kgs)	Number of students
48	3
50	5
56	10
60	15
68	8
78	7
80	5

(1) How many students are there in the class?

(2)Which student's weight is the median weight?

(3) Find the median of weight?

7)The monthly income of 30 families are given in the table. Find the mean and median.

Monthly Income	Number of families
4000	3
5000	5
6000	8
7000	5
8000	4
9000	3
10000	2

Mathematics of chance

POINTS TO REMEMBER

Probability is the ratio of number of favourable outcomes to the total number of outcomes.

Probability = $\dfrac{Number\ of\ favourable\ possibilities}{Total\ number\ of\ possibilities}$

Geometrical Probability

Probability = $\dfrac{Possible\ area}{Total\ area}$

Considering ordered pairs

Probability **=** $\dfrac{Number\ of\ possible\ ordered\ pairs}{Total\ number\ of\ ordered\ pairs}$

Questions

1. There are 6 white beads , 9 black beads and 5 blue beads in a box. If we take a bead without peeking, what is the probability of

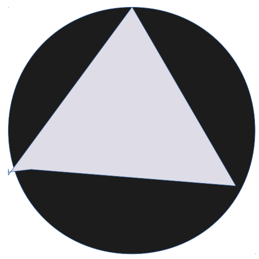
   a. The bead being black?

   b. The bead being while

c. The bead being either black or white?

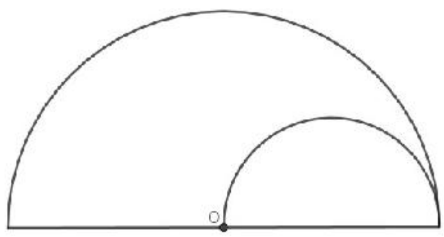
2. How many two digit numbers can be formed using the digits 4,5 and 6. In these two digit numbers what is the probability of digits being same?

3. There are two boxes which contains paper pieces numbered from 1 to 10. If we take a paper from each of the boxes, what is the probability of the numbers being prime?



4. In the figure, an equilateral triangle is drawn inside a circle. If we put a dot in the figure without looking ,what is the probability that the dot is in the shaded portion.

5. The figure contains two semicircles. 'O" is the centre of larger semicircle. If we put a dot in the figure without looking ,what is the probability that the dot is in the smaller semicircle ?



6. A box contains 18 beads of white and black colour. If the probability of taking a black bead is $\frac{2}{3}$ then,

a. How many white beads are there?

b. How many black beads are there?

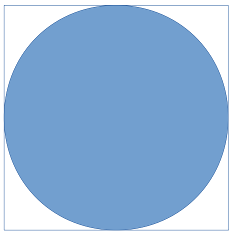
7 A bag contain 8 black ball and 12 white ball Another bag contain total number of white and black balls is 30. If we take a bead from each bag with out looking in to it, then the probability of getting a black ball from the second bag is $\frac{1}{6}$ less than that of the first bag.

a. How many black balls are there in the second bag ?

b. What is the probability of taking a same colour ball from each bag?

8. .If we put a dot in the figure without looking ,what is the probability that

1. the dot is in the shaded region
2. the dot is in the unshaded region



9 In two digit number ,

a. what is the probability of ten's place digit is larger than one's place digit?

b. what is the probability of one's place digit is larger than ten's place digit?

10. The letters of the word "ATTITUDE ' is put in a box.

If we take one letter from it ,

a. what is the probability of getting T

b. what is the probability of not getting T

.

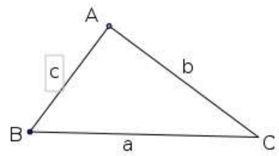
TRIGONOMETRY

POINTS TO REMEMBER

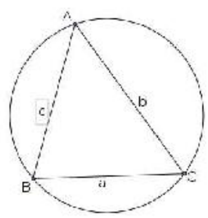
* The sides of any triangle of angles 45° 45° 90° are in the ratio $1:1:\sqrt{2}$
* The sides of any triangle of angles 30° 60° 90° are in the ratio $1:\sqrt{3}:2$
* In a right angled triangle, considering the acute angle, the ratio of opposite side to hypotenuse is called sine ratio(SIN)
* In a right angled triangle, considering the acute angle, the ratio of adjacent side to hypotenuse is called cosine ratio(COS)
*In a right angled triangle, considering the acute angle, the ratio of opposite side to adjacent is called tangent ratio(Tan)

* Area of ΔABC =

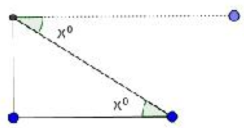
$\frac{1}{2}$ ab sinC $\frac{1}{2}$ bc sinA $\frac{1}{2}$ ac sinB



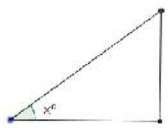
* Length of chord = 2r sin $\frac{c}{2}$, r= radius $\frac{c}{2}$ = half of central angle



* In the figure
a= 2r sinA b=2r sinB, c= 2r sinC



* Angle of depression



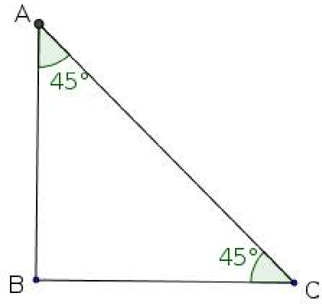
Angle of elevation

Questions

1. In the following right angled triangle, one angle and one side is given find the other two sides.

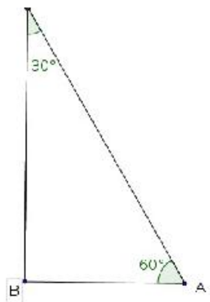
a.

AB	BC	AC
	4	



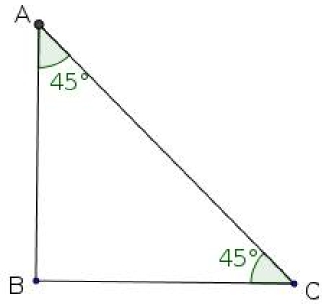
b.

AB	BC	AC
5		



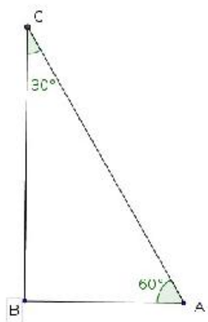
c.

AB	BC	AC
		12



d

AB	BC	AC
	10	

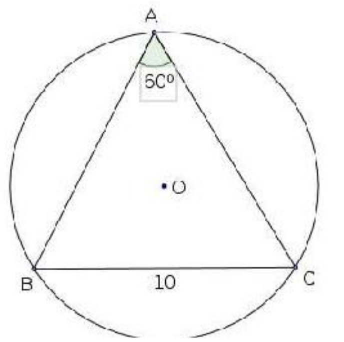


DIET ALAPPUZHA 2021

2. A ladder is being lean on a wall. The foot of the ladder is 5m away from the wall. If the angle between the ground and the ladder is 30^0, find the height at which

3. When the sun is at an angle of elevation of 45^0, the shadow of the tree is of length 20meter. Find the height of the tree.

4. What is the circum diameter of the triangle in the figure?

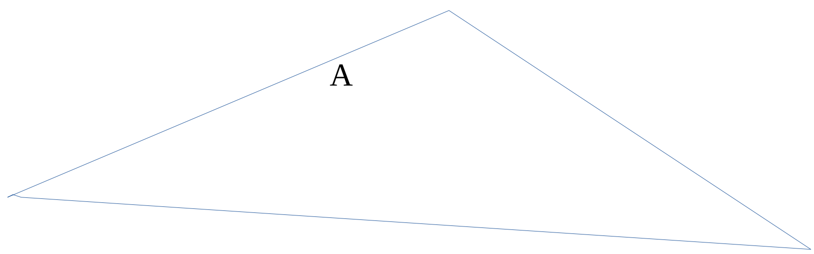


5. In triangle ABC <A = <B = 30, AC = 4cm then

a. Find the length of BC

b. Find the length of AB

C



B

DIET ALAPPUZHA 2021

6. The distance between two buildings is 20 meter. From the of base the bigger building, the top of the smallest building is seen with an angle of elevation45^0, From the of base the smaller building, the top of the bigger building is seen with an angle of elevation60^0,

a. Draw the rough figure?

b. find the height of the buildings

7. A man,1.8 metres tall, stands on the top of a light house 30 metres high and sees a ship at sea at a depression of 40°.

a. Draw the rough figure?
b. How far is the ship from the light house ?

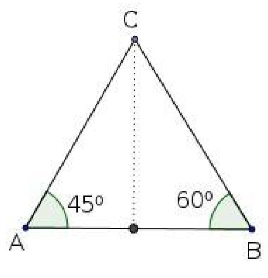
8 . A man standing at the edge of a canal sees the top of a tree at an elevation of 60°. Stepping 10 metres back , he sees it at an elevation of 30°

a Draw the rough figure?
b. Find the width of the canal?
c. Find the height of the tree ?

9. When the sun is at an angle of elevation of 35^0, the shadow of the tree is of length 10meter. Find the length of the shadow if the sun is at an angle of elevation of 25^0 ?

10. In ΔABC, AB=8cm, $\angle A=45^\circ$ and $\angle B=60^\circ$

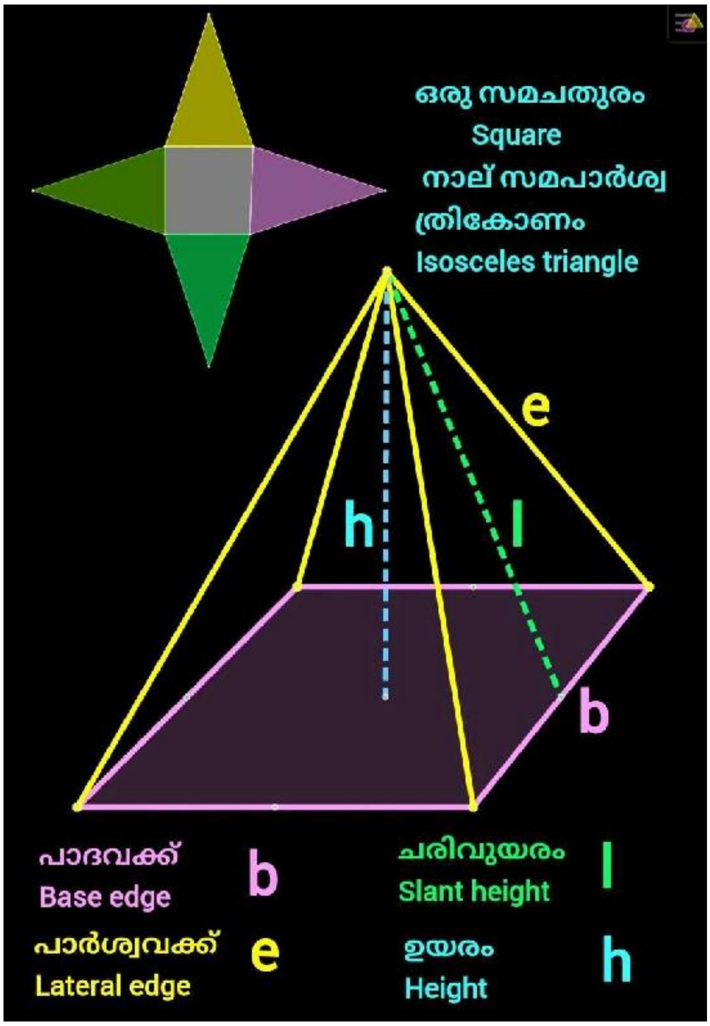
1. Find the perpendicular distance from C to AB
2. Calculate the area of ΔABC ?



SOLIDS

POIN S O REMEMBER

SQUARE PYRAMID



$l^2=h^2+(\frac{a}{2})^2$, $h^2=l^2-(\frac{a}{2})^2$, $(\frac{a}{2})^2=l^2-h^2$

$l^2=e^2-(\frac{a}{2})^2$, $e^2=l^2+(\frac{a}{2})^2$, $(\frac{a}{2})^2=e^2-l^2$

$e^2=h^2+(\frac{d}{2})^2$, $h^2=e^2-(\frac{d}{2})^2$, $(\frac{d}{2})^2=e^2-h^2$

(d- DIAGONAL)

* Lateral Surface Area=2al

* Surface Area =2al+ a^2

* Volume = $\frac{1}{3}$ x a^2 xh

* Square pyramid whose lateral faces are equilateral triangles

Lateral Surface Area = $\sqrt{3}$ x a^2

Surface Area = $\sqrt{3}$ x a^2 + a^2

Volume = $\frac{a^3}{3\sqrt{2}}$

Circular Pyramid (Cone).

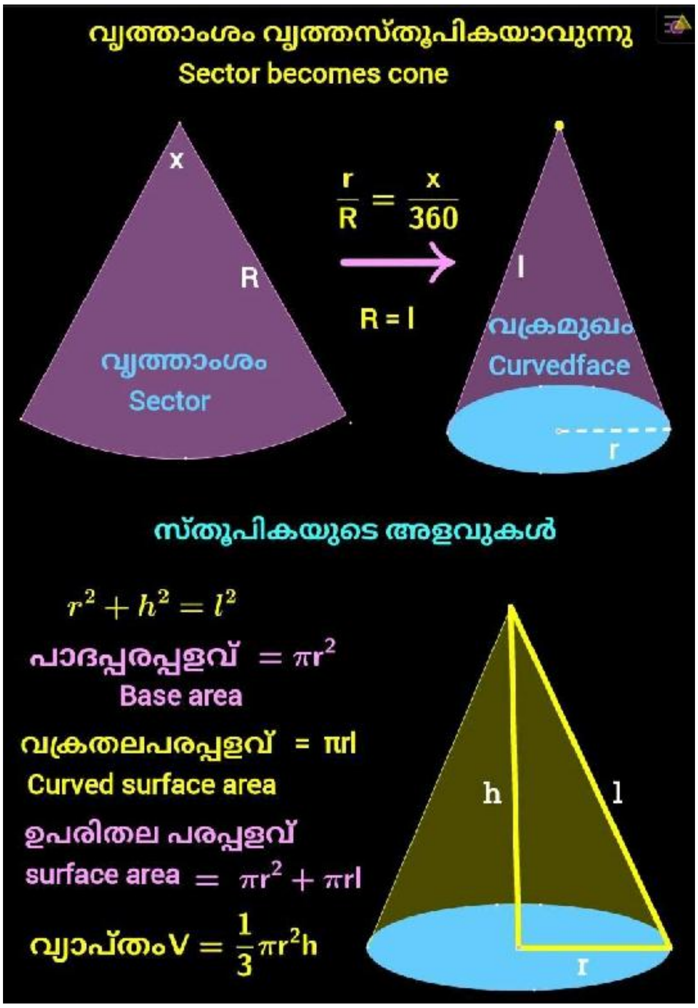
*Radius of sector = Slant height of cone (R=l)

*Arc length of sector = Base perimeter of cone

*Area of sector = Curved surface area of cone

Sphere, Hemisphere

* Surface area of a sphere of radius r= $4\pi r^2$
* Volume of a phere of radiu r = $\frac{4}{3}\pi r^3$
* Surface area of a hemisphere of radius r= $3\pi r^2$
* Curved surface area of hemisphere of radius r= $2\pi r^2$
* Volume of hemisphere of radius r = $\frac{2}{3}\pi r^3$



Questions

1. A circle of radius 12 cm is divided into 4 equal sectors. A circular pyramid is made using each sector .

    a. find the slant height of the circular pyramid

    b. find the radius of the circular pyramid.

2. A square prism is of base perimeter 64cm and height 15cm . A largest square pyramid which can be carved from it. Find the

    (a) slant height of the square pyramid?

    b) find the lateral surface area of square pyramid?

    c) find the total surface area of square pyramid?

    d) Find the volume of the pyramid

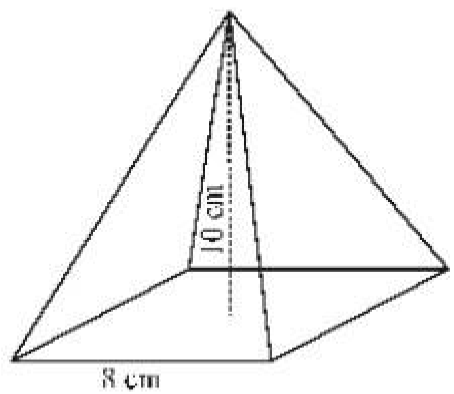
3. The surface area of the sphere is 100π cm^{2} .

    a. Find the radius

    b. Find the volume

4. Find the volume and total surface area of the largest circular pyramid which can be carved from a cube of side 12 cm.

5. Find the volume and total surface area of the square pyramid



6. A sector is cut out from a circle of radius 25cm and made into a cone . The radius of this cone is 10cm

    1. what is the central angle of the sector.

    2. Find the height of the cone?

7. A metallic sector of central angle 240^0 and radius 15 cm is rolled up to form a cone. What is the volume of the cone so formed?

8. a) What is the volume of a solid metal cylinder of height 4 cms and radius 5 cms?

   b) This solid is melted and recast in to 5 cones of equal height and radius 2 cms.

   c)Find the height of such a cone

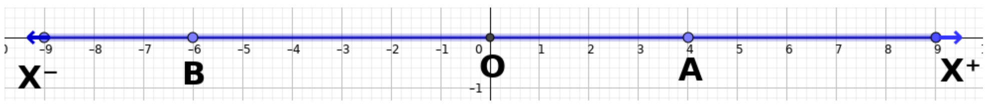
9. A water tank is in the shape of a cylinder whose ends are joined by hemisphere. The diameter is 2m and the length of the tank is 8m. If the cost of painting is Rs.60 per square meter, find the cost of painting the whole tank?

10. We want to make a paper pyramid with base a square of 10 cms and height 12 cms .What should be the lengths of the sides of the triangles? 8

CO ORDINATES

POINTS TO REMEMBER

1. Coordinate axes, coordinates
2.Representing the position of points using pairs of numbers
3.Formation of geometrical figures by joining the coordinates of points
4.Identifying coordinates of vertices of a rectangle in which sides are parallel to the axes
5.Identifying coordinates of vertices of a rectangles and parallelograms in which sides are not parallel to the axes
6.Identifying coordinates of vertices of geometrical figures
7. Finding distance between two points using coordinates

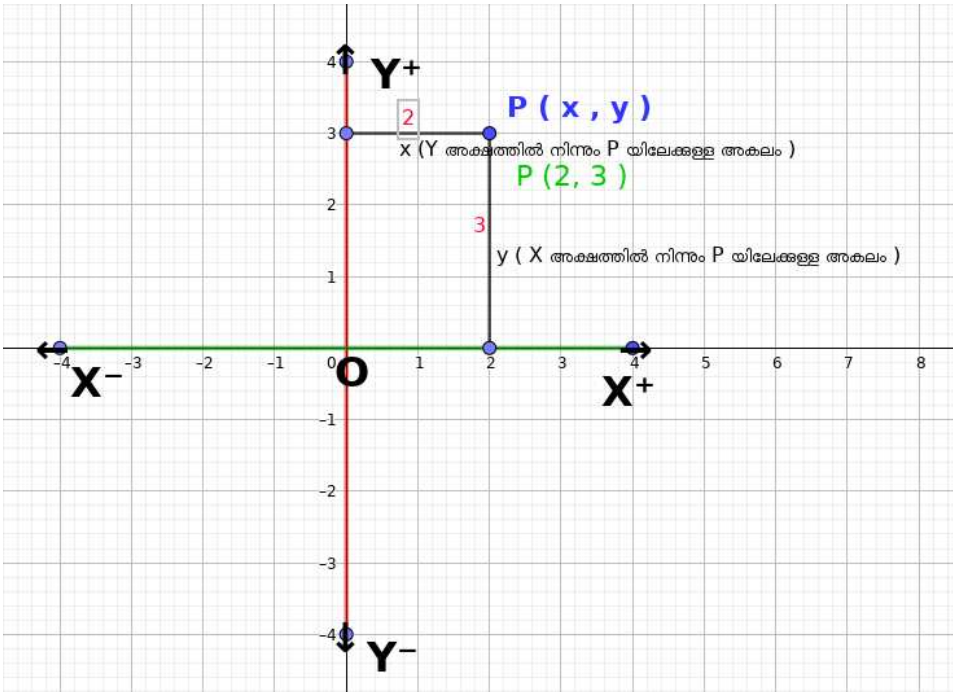


The position of a point on the number line can be represented by a single number

The position of A is 4 units right of 0
The position of B is 6 units left of 0

The position of a point on a plane can be represented by coordinates based on coordinate axes

Coordinate axes
X Axis (Horizontal line) Y Axis (perpendicular Line)

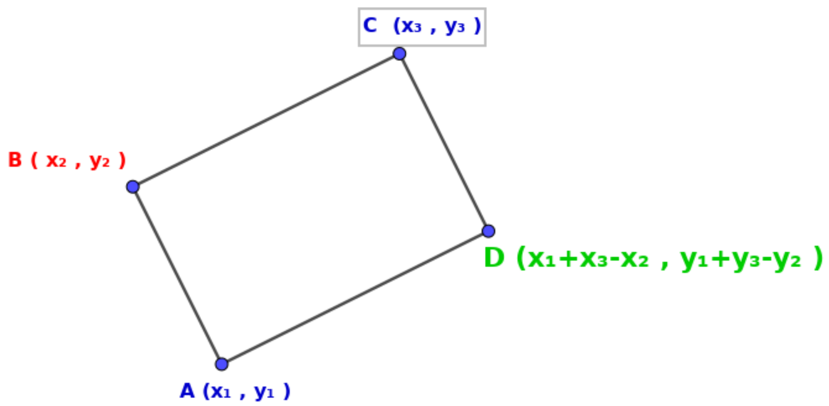


Coordinates- Pairs of Numbers
P(x,y) x coordinate (distance of P from the Y axis)
y coordinate (distance of P from the X axis)

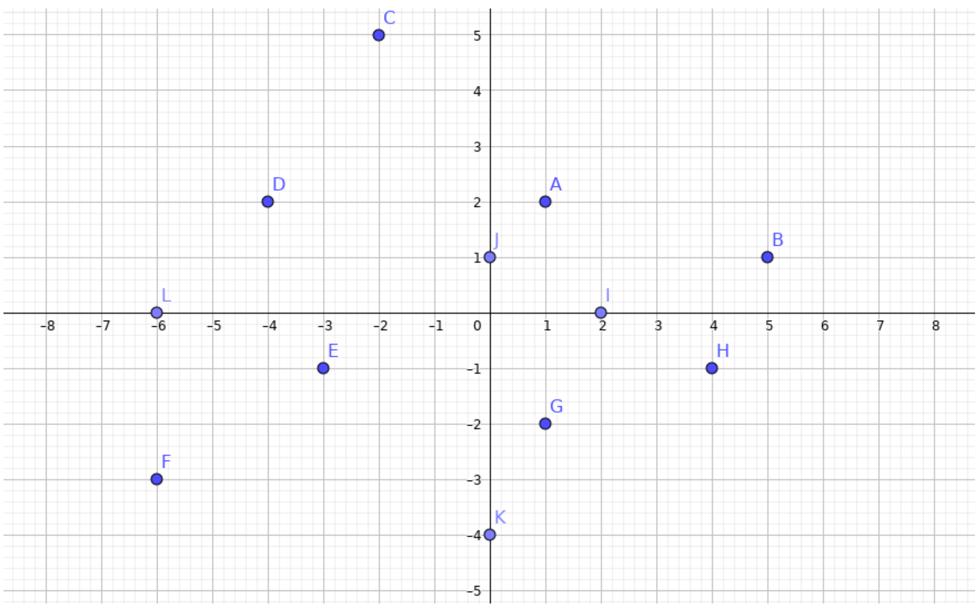
The distance between the Points $A(x_1,y_1)$ $B(x_2,y_2)$ is $\sqrt{(x2-x1)^2+(y2-y1)^2}$

The x coordinate of any point on the Y axis is 0
The y coordinate of any point on the X axis is 0

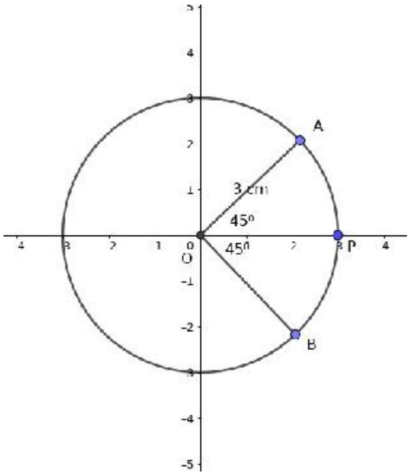
Finding the fourth vertex of a rectangle, square, parallelogram, Rhombus, When the other three vertices are given



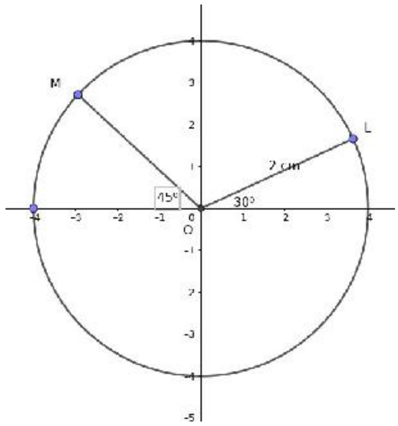
1. Draw the coordinate axes and plot the points A(-3,-1), B(-1,2) , C(2,-1), D(4,2).
   Join the points in order, and name the polygon thus obtained.
2. Writhe the coordinates of the points A, B, C,D,E,F,G,H,I,J,K,L



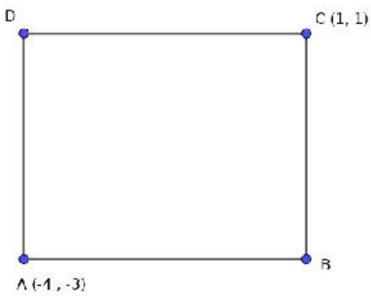
3. If the radius of the circle with centre O is 3 units, Write the coordinates of P ,A and B



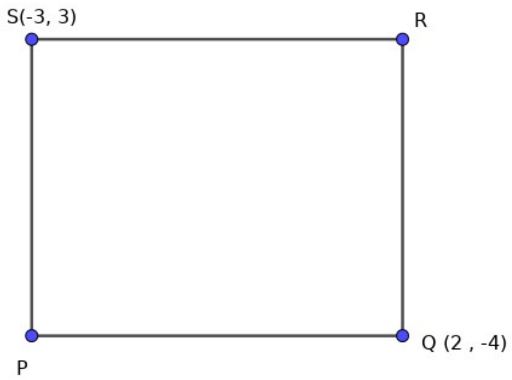
4.If the radius of the circle with centre O is 4units, Write the coordinates of P and Q.
5.If the radius of the circle with centre O is 2units, Write the coordinates of L and M



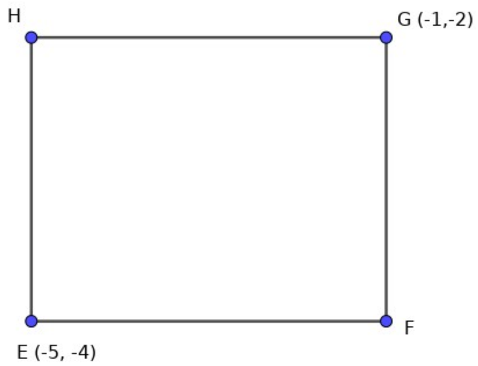
6. The sides of the rectangle are parallel to the axes. Write the coordinates of the vertices B and D



7.The sides of the rectangle are parallel to the axes. Write the coordinates of the vertices P andR



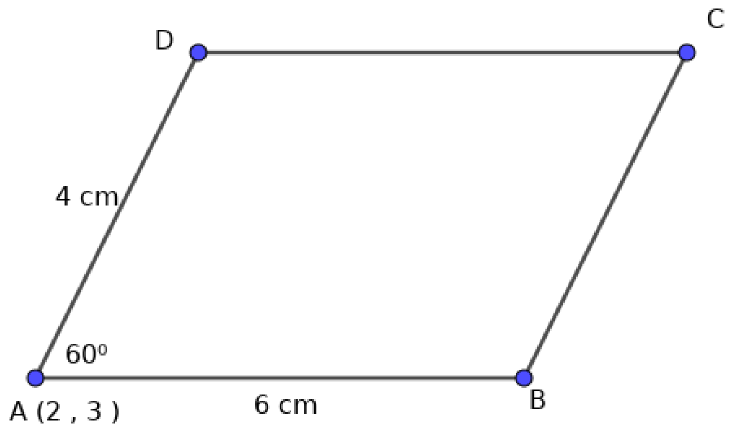
8.The sides of the rectangle are parallel to the axes. Write the coordinates of the vertices F and H



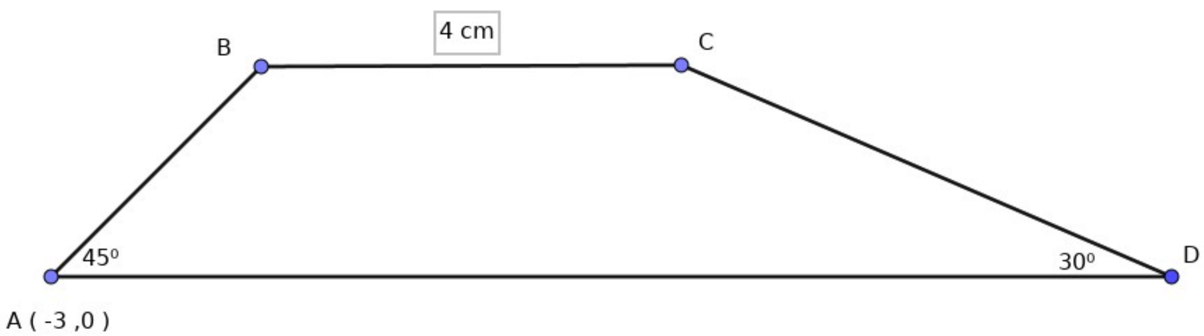
9.The opposite vertices of a rectangle with sides parallel to the axes are (-2 , -1) , (4, 5).
a) find the coordinates of the other vertices?.
b) Calculate its , Perimeter, Area and length of the diagonal.

10.The circle with centre (3,4) passes through through the point P(7,7)
a) Calculate the radius of the circle?
b) find the coordinates of points of intersection of this circle with the axes?

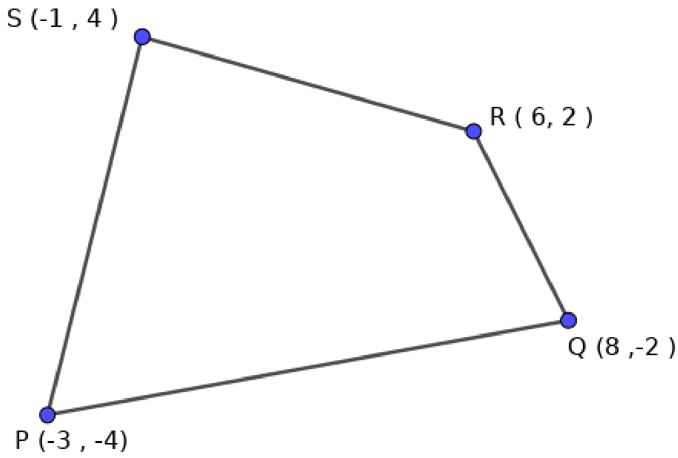
11.In the figure the side AB of the parallelogram is parallel to the X axis. If A (2, 3) , AB = 6 cm , AD = 4 cm , <DAB = 60°, find the coordinates of the points B, C and D



12. In the figure the sides AD and Bc are parallel to the X axis. Find the coordinates of the points B, C and D



13.Calculate the length of the diagonal and Perimeter of the quadrilateral PQRS?

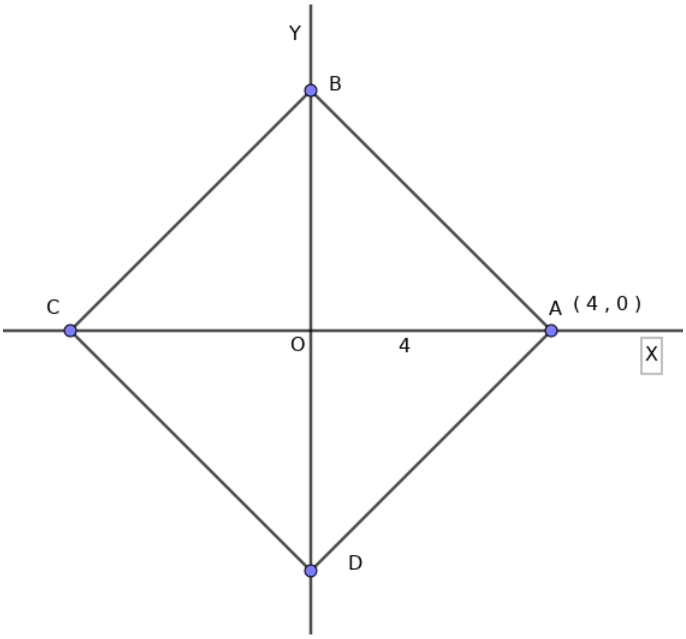


14. Prove that the points A (-4 , 3) , B (2 , -3) , C (6 , 1) are the vertices of a right angled triangle. Also find the length of its hypotenuse .

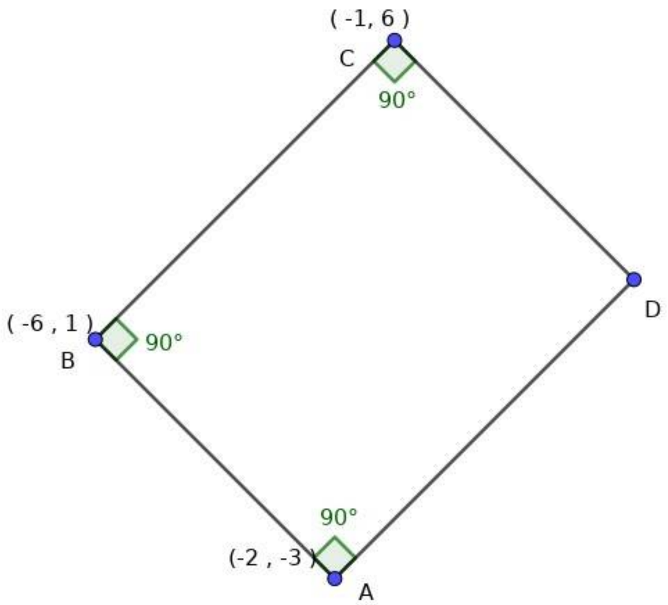
15.In the figure ABCD is a square.

a) Write the coordinates of the points B, C, and D.

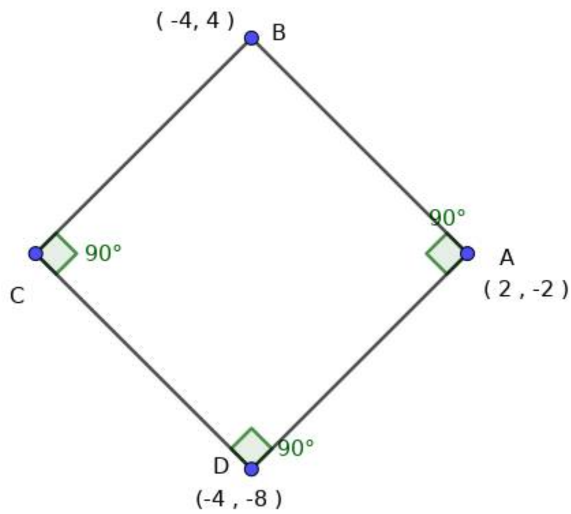
b) Calculate its area and Perimeter?



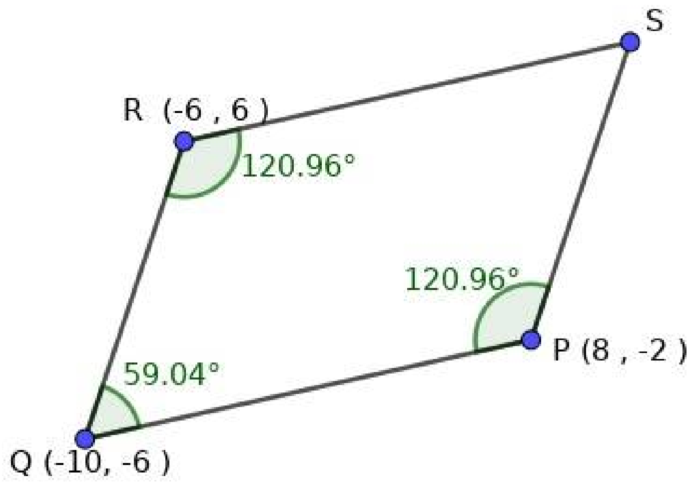
16.Write the coordinates of the fourth vertex of the rectangle.



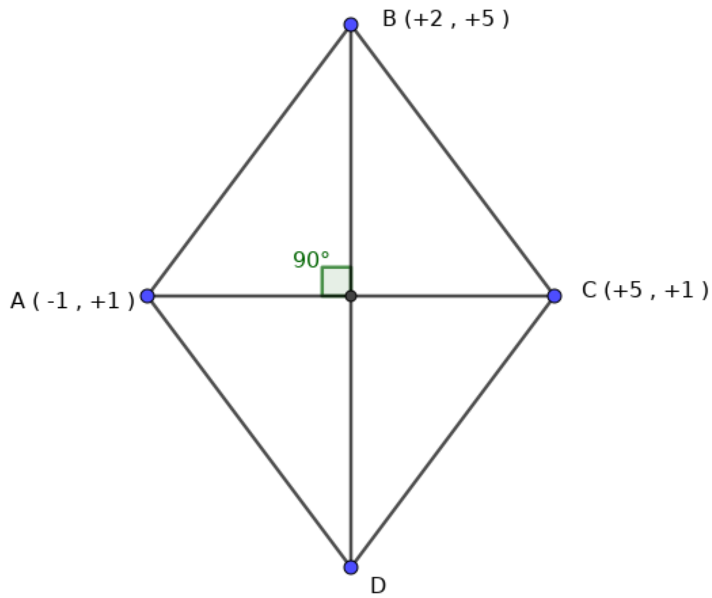
17.Write the coordinates of the fourth vertex of the square.



18.Write the coordinates of the fourth vertex of the parallelogram.



19.Write the coordinates of the fourth vertex of the rhombus.



20.(3,4) is a point on a circle with centre at the origin.

a) Calculate the radius of the circle.

b) Write the coordinates of the points of intersection of the circle and the axes.

10 POLYNOMIALS

Factors and Solutions

The Difference of squares of two numbers is the product of their sum and difference

$x^2 - y^2 = (x + y)(x - y)$

$x^2 - 16 = x^2 - 4^2 = (x + 4)(x - 4)$

$x^2 - 5x + 6 = (x - 2)(x - 3)$

The binomials $(x - 2)(x - 3)$ are the factors of $x^2 - 5x + 6$.

If $p(x) = q(x) * r(x)$ then $q(x)$ and $r(x)$ are factors of $p(x)$

1.Which number should be added to $p(x)=x^2 + 5x - 11$, for $x - 3$ be a factor

2.Write each of the following as product of two first degree polynomials

1. $x^2 - 10x + 21$
2. $x^2 - 4x - 21$
3. $x^2 + 4x - 21$
4. $x^2 + 10x + 21$

3.. Consider the polynomial $P(x) = 2x^3 + 7x^2 - 3x + 4$

1. Find $p(1), p(2), p(3)$
2. Find $P(x) - p(1)$, and find its factors
3. Find $P(x) - p(2)$ and find its factors
4. Find $P(x) - p(3)$ and find its factors

4. Find the value of k, if x-3 is a factor of $P(x) = x^3 + kx^2 + x + 6$. Check whether x-2 is a factor

5.p(x) is a second degree polynomial. And $P(7) = 0$, $P(-4) = 0$, write p(x)

6.x-8 and x+5 are factors of a second degree polynomial p(x). Write p(x)

7.$P(x) = 3x^2 - 5x + 17$, What should be subtracted from p(x) for x+5 a factor

20.(3,4) is a point on a circle with centre at the origin.
a) Calculate the radius of the circle.
b) Write the coordinates of the points of intersection of the circle and the axes.

10 POLYNOMIALS

Factors and Solutions

If the polynomial $p(x)$ is the product of the polynomials $q(x)$ and $r(x)$, then we say that the polynomials $q(x)$ and $r(x)$ are factors of the polynomial $p(x)$

If the first degree polynomial $x - a$ is a factor of the polynomial $p(x)$, then $p(a) = 0$; that is, a is a solution of the equation $p(x) = 0$

If the polynomial $p(x)$ can be split into first degree factors as

$$p(x) = (x - a_1)(x - a_2) \ldots (x - a_n)$$

then the numbers $a_1, a_2, \ldots, a_n$ are the solutions of the equation $p(x) = 0$

The Difference of squares of two numbers is the product of their sum and difference

$x^2 - y^2 = (x + y)(x - y)$
$x^2 - 16 = x^2 - 4^2 = (x + 4)(x - 4)$
$x^2 - 5x + 6 = (x - 2)(x - 3)$

The binomials $(x - 2)(x - 3)$ are the factors of $x^2 - 5x + 6$.
If $p(x) = q(x) * r(x)$ then $q(x)$ and $r(x)$ are factors of $p(x)$

For any second degree polynomial $p(x)$ and for any number a, if $p(a) = 0$, then the first degree polynomial $x - a$ is a factor of the polynomial $p(x)$

1.Which number should be added to $p(x)=x^2 + 5x - 11$, for $x - 3$ be a factor

2.Write each of the following as product of two first degree polynomials

1. $x^2 - 10x + 21$
2. $x^2 - 4x - 21$
3. $x^2 + 4x - 21$
4. $x^2 + 10x + 21$

3.. Consider the polynomial $P(x) = 2x^3 + 7x^2 - 3x + 4$

1. Find $p(1), p(2), p(3)$
2. Find $P(x) - p(1)$, and find its factors
3. Find $P(x) - p(2)$ and find its factors
4. Find $P(x) - p(3)$ and find its factors

4. Find the value of k, if x-3 is a factor of $P(x) = x^3 + kx^2 + x + 6$. Check whether x-2 is a factor

5.p(x) is a second degree polynomial. And $P(7) = 0$, $P(-4) = 0$, write p(x)

6.x-8 and x+5 are factors of a second degree polynomial p(x). Write p(x)

7.$P(x) = 3x^2 - 5x + 17$, What should be subtracted from p(x) for x+5 a factor

8.$P(x) = x^2 + ax + b$ and x-7 is a factor and $p(4)=0$, calculate the values of a and b

9.What is the reminder when $x^3 + 8x^2 + 7x - 13$ is divided by $(2x - 1)$

10. Check whether (2x+3) is a factor of $P(x) = 2x^3 + 7x^2 - 5x + 3$

Quotient and remainder

We have seen that if we take a polynomial $p(x)$ and a number a, then $x - a$ is a factor of $p(x) - p(a)$. (The box, First degree factors).

So, the polynomial $p(x) - p(a)$ can be written as the product of $x - a$ and a polynomial $q(x)$:

$$p(x) - p(a) = (x - a)\ q(x)$$

We can make a slight change and write this as

$$p(x) = (x - a)\ q(x) + p(a)$$

This means that for any polynomial $p(x)$ and any number a, we can write $p(x)$ as a sum of a product of $x - a$ by a polynomial and a number.

This is somewhat like writing

$$18 = (7 \times 2) + 4$$

in the quotient-remainder form. So, in the equation $p(x) = (x - a)\ q(x) + p(a)$ also, $q(x)$ is called the quotient on dividing $p(x)$ by $x - a$ and $p(a)$ is called the remainder.

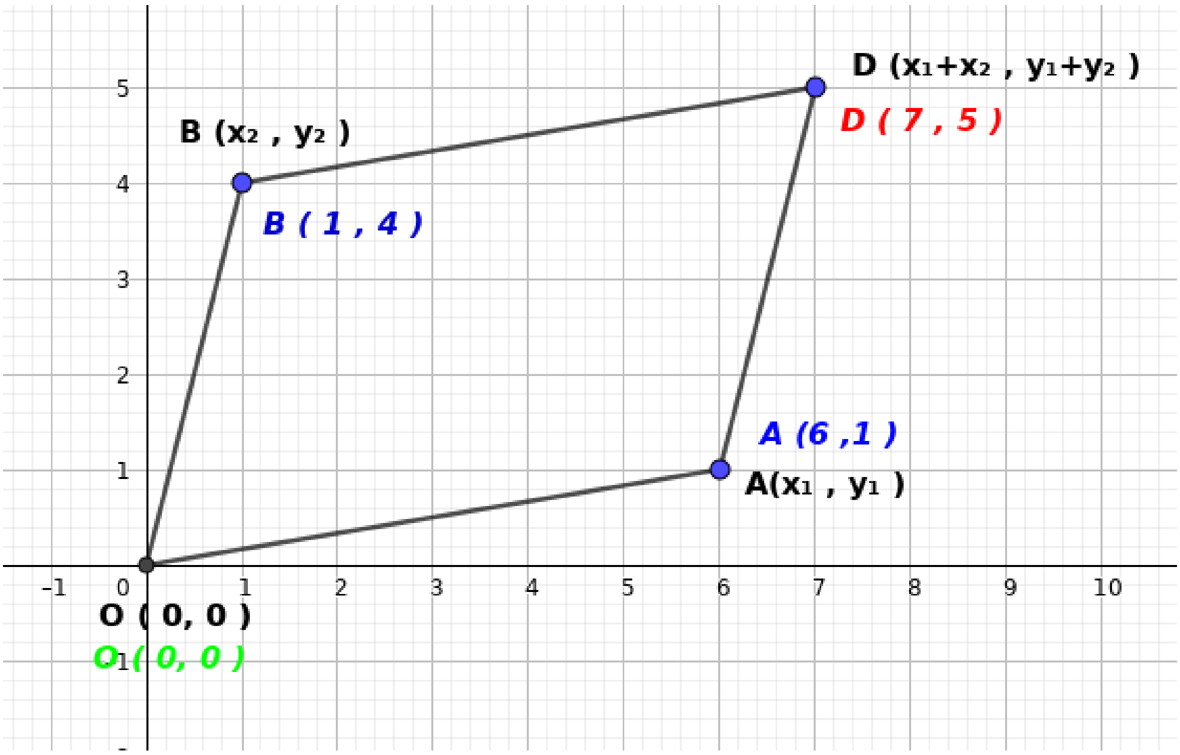
8.P(x) = $x^2 + ax + b$ and x-7 is a factor and p(4)=0, calculate the values of a and b

9.What is the reminder when $x^3 + 8x^2 + 7x - 13$ is divided by (2x – 1)

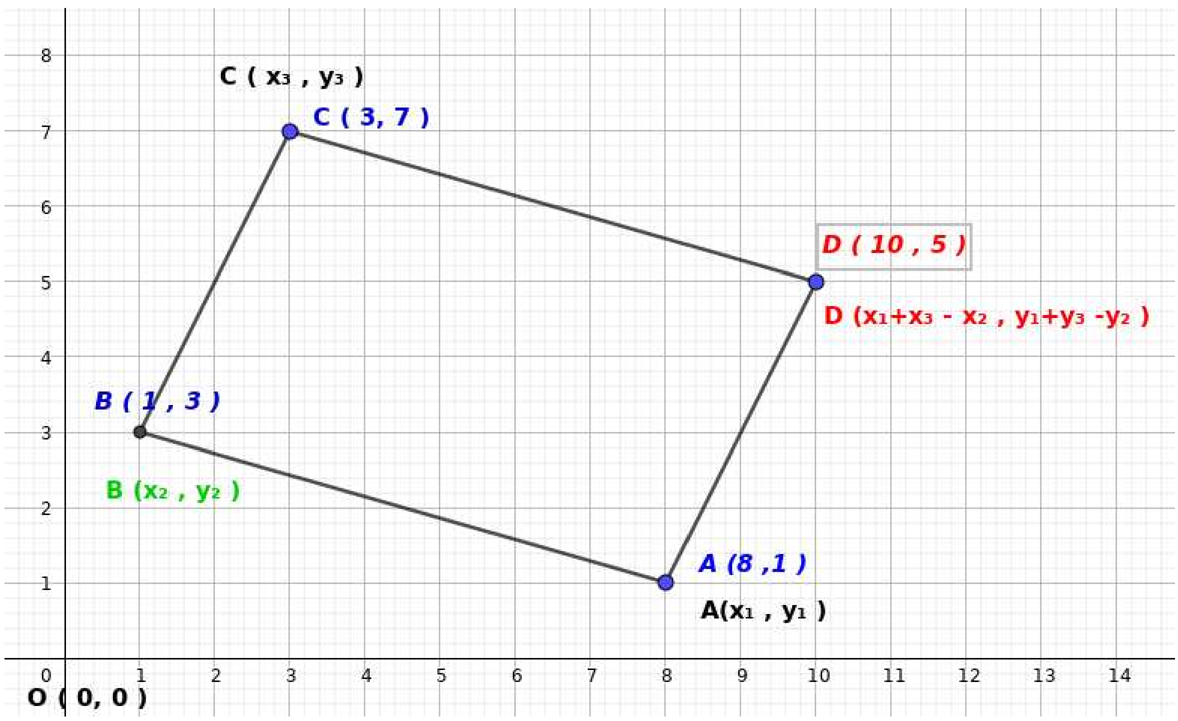
10. Check whether (2x+3) is a factor of P(x) = $2x^3 + 7x^2 - 5x + 3$

GEOMETRY AND ALGEBRA

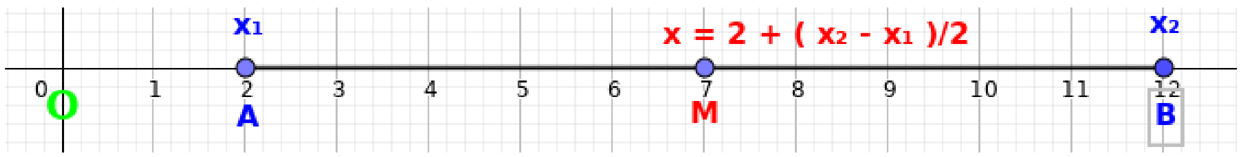
One vertex of a parallelogram is (0 , 0) and the adjacent vertices are $(x_1, y_1)$and (x_2, y_2) then its fourth vertex will be $(x_1 + x_2, y_1 + y_2)$



Three vertices of a parallelogram are A (x_1, y_1), B (x_2, y_2), and C (x_3, y_3). Then its fourth vertex is $(x_1 + x_3 - x_2, y_1 + y_3 - y_2)$



MID POINT



In a number line the midpoint of AB is M and it is 5 units or $\frac{12-2}{2}$ on right that is M is at a distance of 7 units right of origin

The position of M is $x = x_1 + (x_2\ x_1)/2$

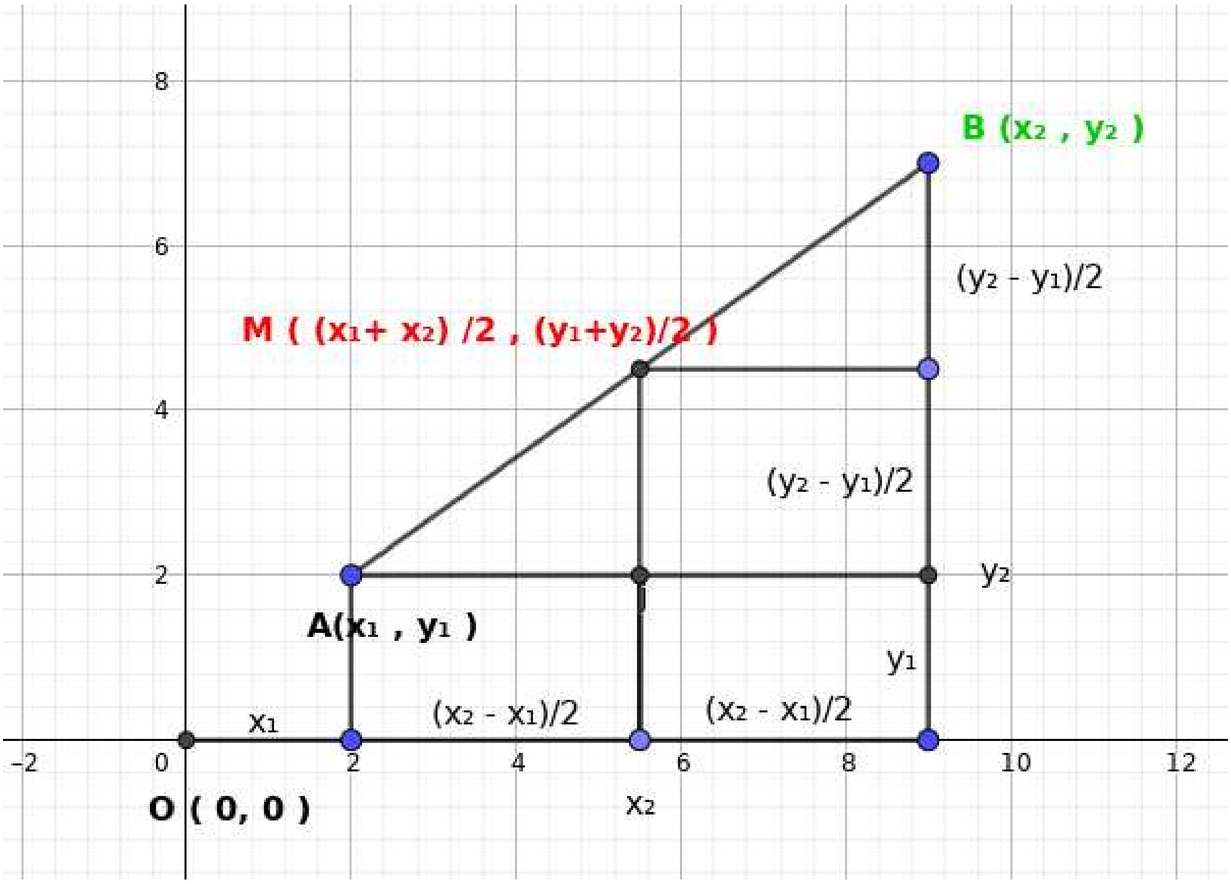
The coordinates of the mid point M (x , y) of the line joining A (x_1 , y_1) , B (x_2 , y_2)

$x = x_1 + (x_2 - x_1) / 2$

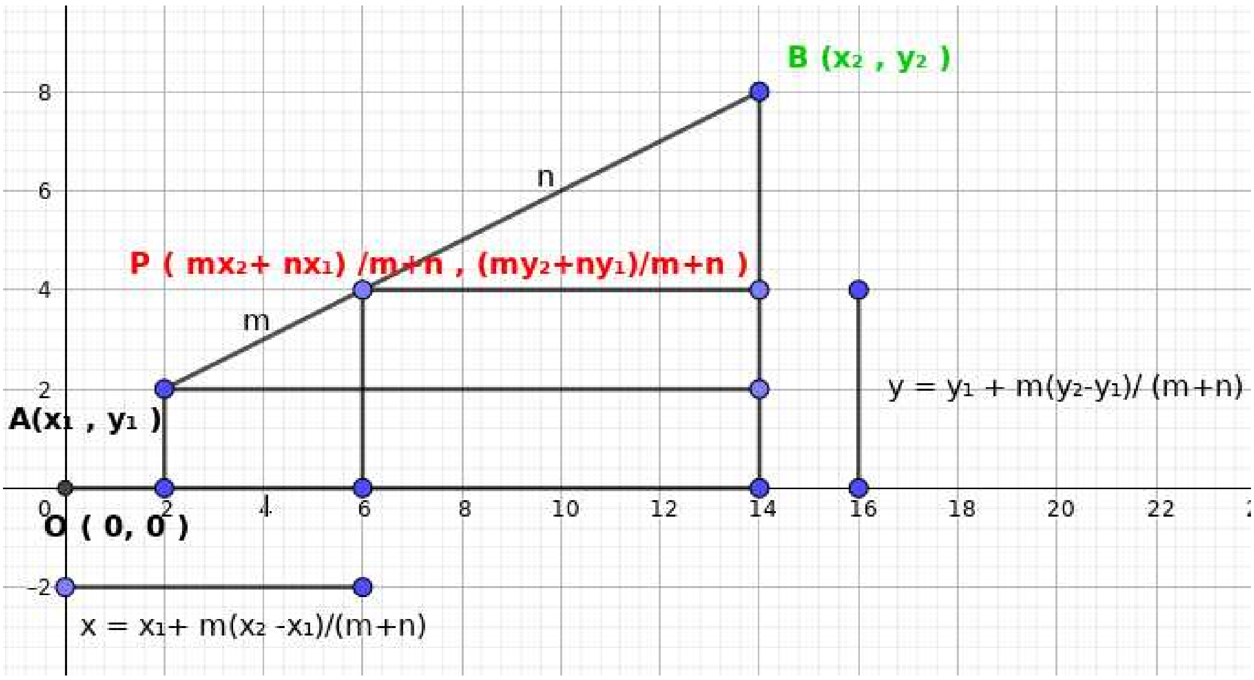
$y = y_1 + (y_2 - y_1) / 2$

$x = (x_1 + x_2) / 2$

$y = (y_1 + y_2) / 2$



Proportion

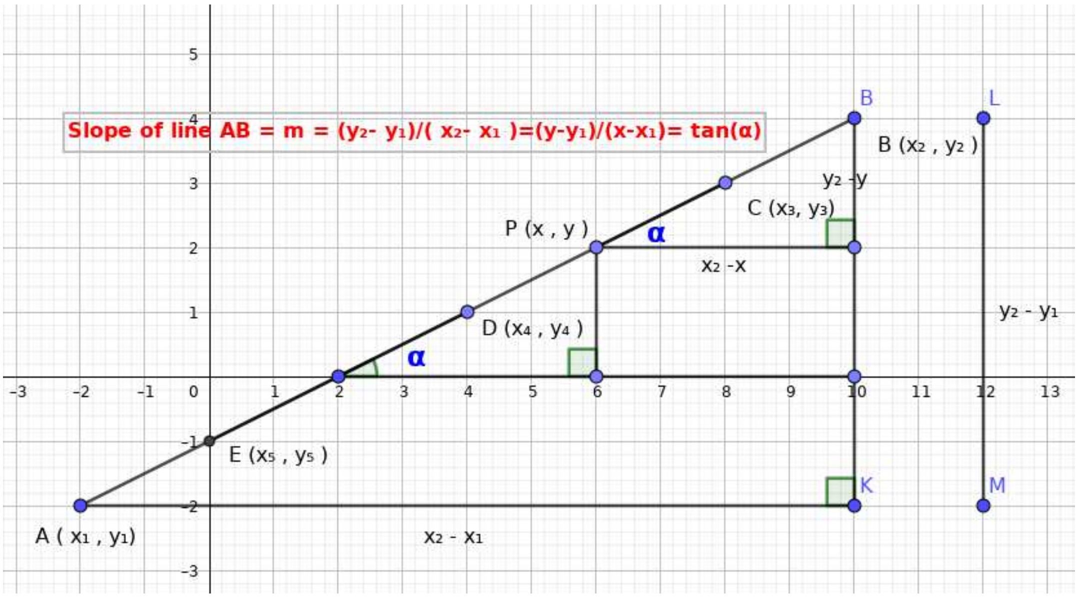


P divides the line AB in the ratio m:n
the length of AP is m/(m+n) part of AB
The x coordinate of P is $x = (mx_2 + nx_1)/(m+n)$
The y coordinate of P is $y=(my_2 + ny_1)/(m+n)$

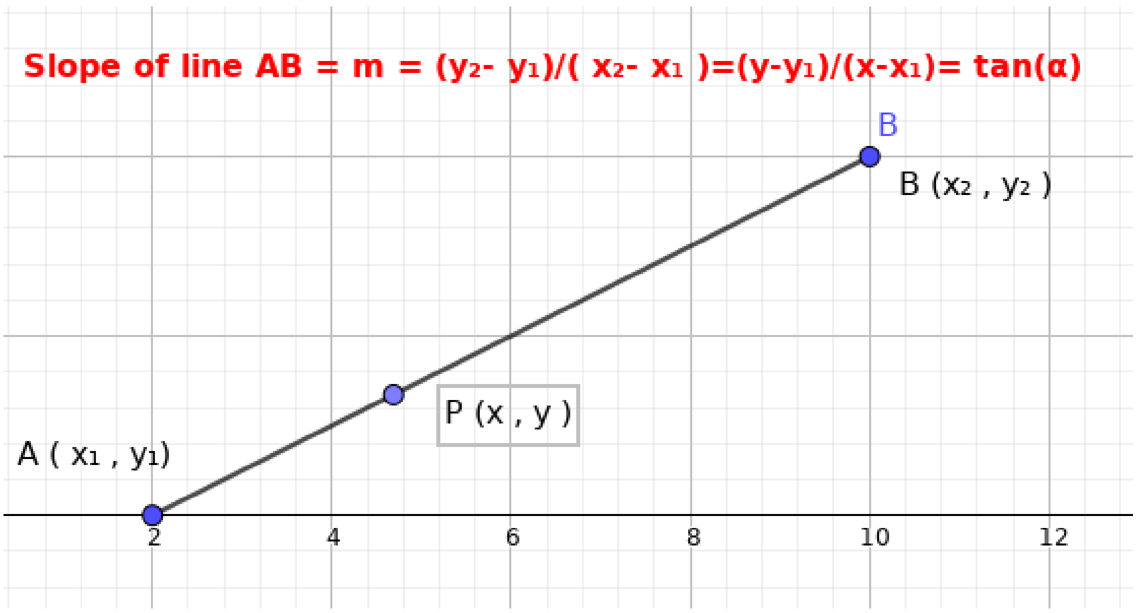
Line Problem
Only one line can be drawn by joining two points.

If the x coordinate of points on a line are different the line is not parallel to Y axis
If the y coordinate of points on a line are different the line is not parallel to X axis
The x and y coordinates of points on a line are different ,the line is not parallel to either axes. It is a slanted line.
On a slanted line the change in y coordinate is proportional to the change in x coordinate
The change in y coordinate $=y_2 - y_1$
The change in x coordinate $=x_2 - x_1$

$\frac{\textit{The change y coordinate}}{\textit{The change x coordinate}} \quad \frac{y2 \quad y1}{x2 \quad x1} \quad m$, The constant of proportionality is called slope of the line



Equation of a line



The equation of a line passing through A (x_1, y_1), B (x_2, y_2) is

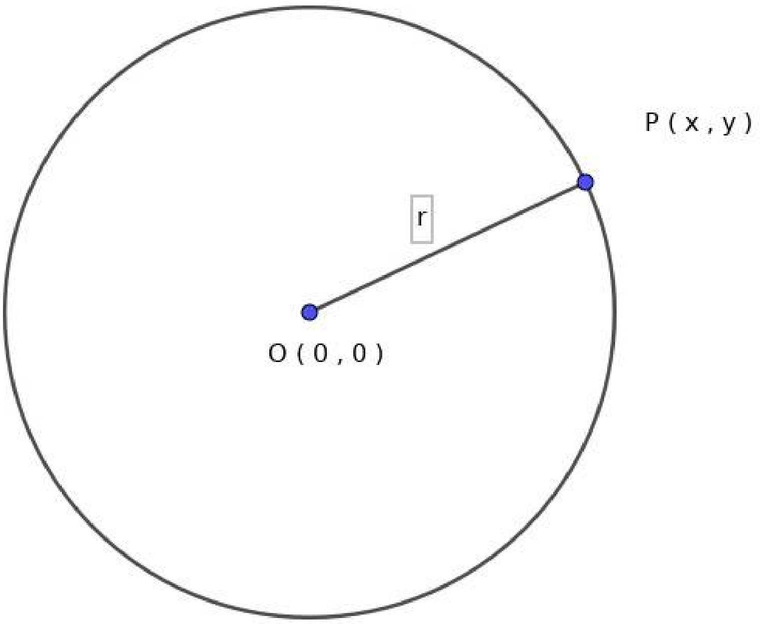
$$\frac{y - y_1}{x - x_1} = \frac{y_2 - y_1}{x_2 - x_1} \quad \text{OR} \quad y - y_1 = \left(\frac{y_2 - y_1}{x_2 - x_1}\right)(x - x_1)$$

The product of the slopes of perpendicular lines is -1
Slope of parallel lines are equal
Slope of X Axis is Zero
Slope of Y axis is Not Defined

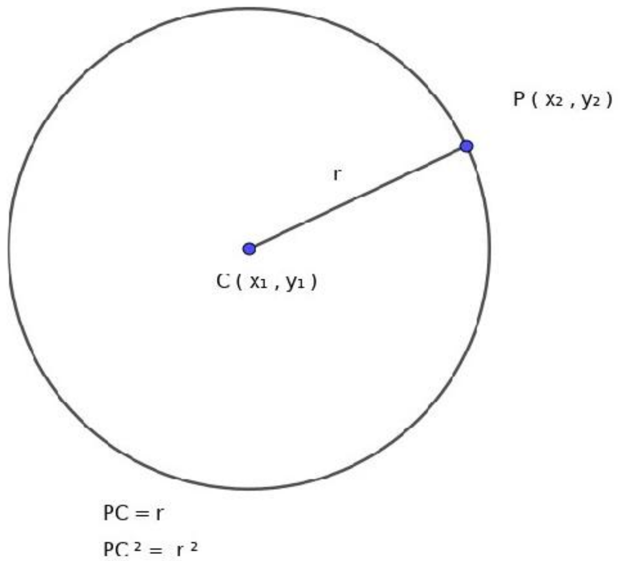
Equation of a Circle

The equation of a circle with centre at the origin and passing through (x,y) and has a radius r is

$x^2 + y^2 = r^2$

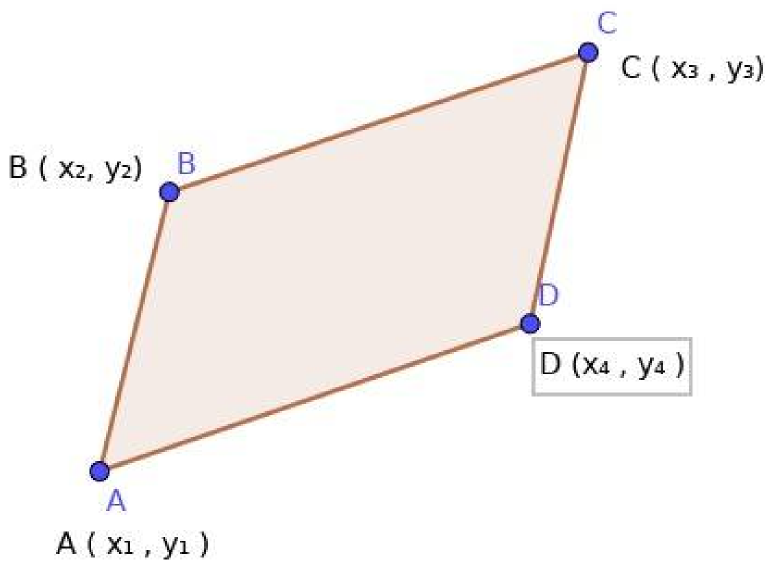


The equation of a circle with centre at (x_1,y_1) and radius r , passing through (x,y) is
$(x - x_1)^2 + (y - y_1)^2 = r^2$

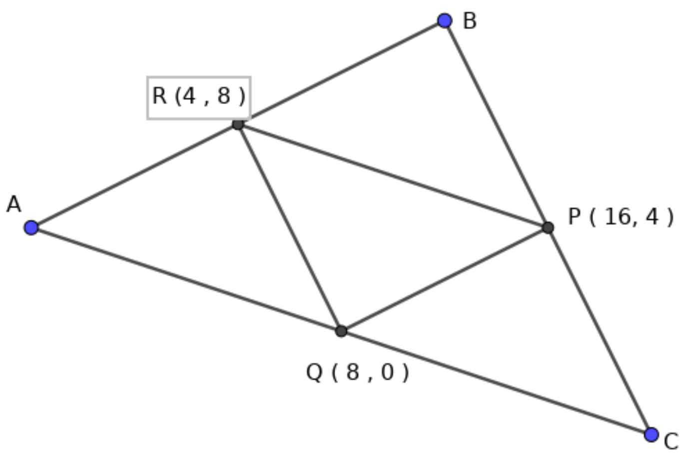


1. Prove that the sum of squares of all sides of a parallelogram is equal to the sum of the squares of its diagonals?

2.In parallelogram ABCD, Prove that $x_1 + x_3 = x_2 + x_4$ and $y_1 + y_3 = y_2 + y_4$

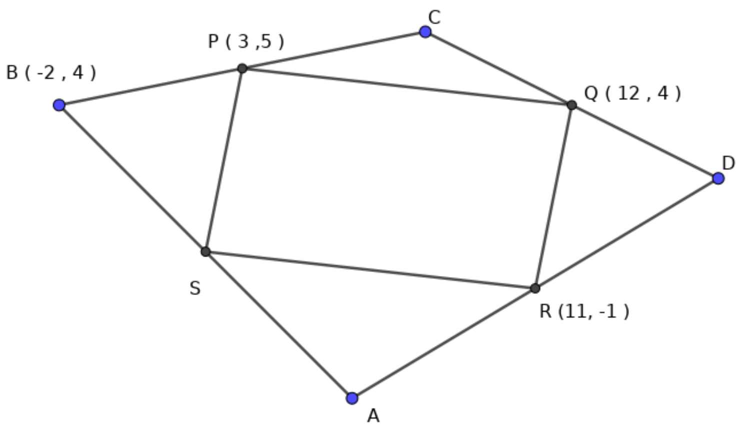


3. In the figure P,Q,R are the midpoints of the sides of ΔABC. Find the coordinates of A, B, and C



4. A(-3,-1), B(1,5) C(11,3) and D(9,-3) are the vertices of a quadrilateral ABCD.
   a) Find the coordinates of the midpoints of each side
   b) Prove that the quadrilateral formed by joining the midpoints is a parallolgram

5.The vertices of the quadrilateral PQRS are the midpoints the sides of quadrilateral ABCD. Write the coordinates of A,C, D and S



DIET ALAPPUZHA 2021

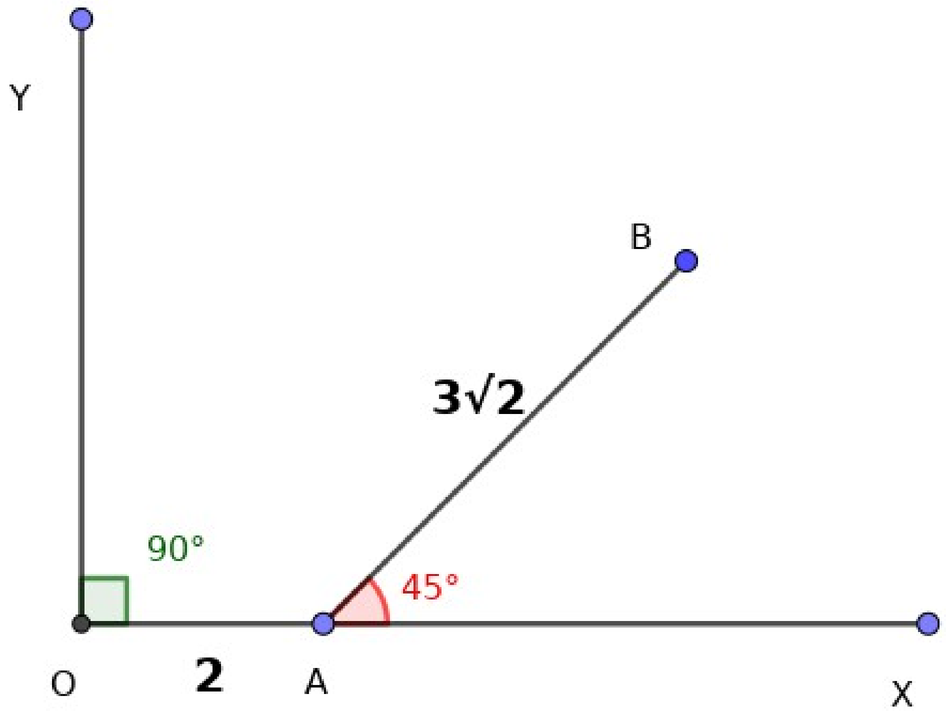
6.Find the coordinates of points which divides the line joining the points (2 , 8) , (8 , -4) into three equal parts

7.Find the coordinates of points which divides the line joining the points (-8 , -6) , (16 , 6)into three equal parts

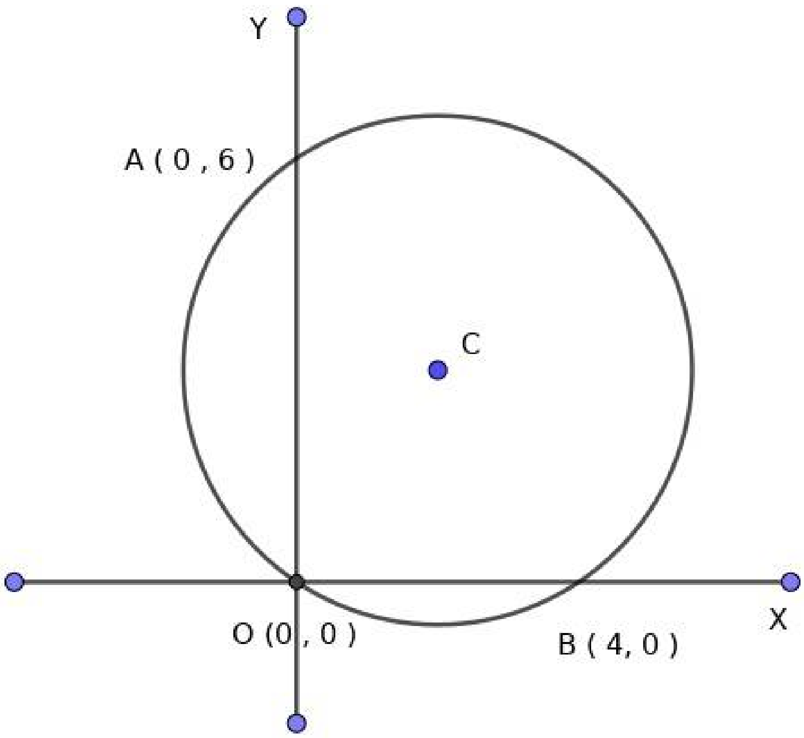
8.Find the coordinates of the points of intersection of the line joining the points (-6 , -6), (14 , 4) and the Axes.

9. a)write the equation of the line joining the points (-3 , 3),(12 , 2)
b) Find the coordinates of the point of intersection of this line with the axes.
c)Check whether the points A(3 , 1), B (1, 2) are on this line?..

10.a) Write the coordinates of the points A and B in the picture
b) Find the slope of the line?.
c) Write the equation of the line



11. a)Write the coordinates of the centre of the circle.
 b)calculate the radius of this circle.
 c)Write the equation of the circle.



12. Find the coordinates of the point of intersection of X axis and the circle $x^2 + y^2 -10x - 6y +,16 = 0$. If the centre of this circle is (5,3), Calculate its radius?

13.A circle with centre (0,0) passes through (3,4).
 a)Calculate its radius?
 b)Write the equation of this circle
 c)Write the coordinates of four other points on this circle.

Constructions

a) Circum circle

b) Rectangle and square of equal area

c) Tangent at a point

d) Tangents from an external point.

e) Incircle using the concept of tangents.

Questions

1. Draw a triangle of circum radius 3 cm and two of the angles 30^0 and 70^0
2. Draw a triangle of circum radius 3 cm and two of the angles $32.5^0$and 37.5^0
3. Draw a triangle of circum radius 3 cm and two of the angles $50^0$and 60^0
4. Draw a triangle of circum radius 3.5 cm and two of the angles 60^0 and 60^0
5. Draw a triangle of circum radius 4 cm and two of the angles 65^0 and 55^0

Questions

1. Draw a rectangle of sides 5 cm and 3 cm. Draw a square having area equal to the area of the rectangle.

2. Draw a rectangle of sides 5 cm and 4 cm. Draw a square having area equal to the area of the rectangle.

3. Draw a rectangle of area 18 sq cm. Construct a square with the same area.

4. Draw a square of area 21 sq cm.

5. Draw a square [redacted]

Questions

1. Draw a circle of radius 2 cm. Mark a point A on the circle and draw a tangent through A.
2. Draw a circle of radius 2.5 cm. Mark a point B on the circle and draw a tangent through B
3. Draw a circle of radius 3 cm. Mark a point C on the circle and draw a tangent through C
4. Draw a circle of radius 3.5 cm. Mark a point P on the circle and draw a tangent through P
5. Draw a circle of radius 4 cm. Mark a point Q on the circle and draw a tangent through Q

Questions

1. Draw a circle of radius 3 cm. Mark a point P, 5 cm away from the centre. Draw two tangents and measure the length.
2. Draw a circle of radius 6 cm. Mark a point P, 10 cm away from the centre. Draw two tangents and measure the length.
3. Draw a circle of radius 3 cm. Mark a point P, 7 cm away from the centre. Draw two tangents and measure the length.
4. Draw a circle of radius 2.5cm. Mark a point P, 6.5 cm away from the centre. Draw two tangents and measure the length.
5. Draw a circle of radius 4 cm. Mark a point P, 8 cm away from the centre. Draw two tangents and measure the length.

Questions

- 1. Draw a circle of radius 2 cm. Draw a triangle with angles 40,60, 80 whose sides are tangents to the circle.
- 2. Draw a circle of radius 2 cm. Draw a triangle with angles 50, 60,70 whose sides are tangents to the circle.
- 3. Draw a circle of radius 2.5 cm. Draw a triangle with angles 50,65,65 whose sides are tangents to the circle.
- 4. Draw a circle of radius 2.5 cm. Draw a triangle with angles 55,65 whose sides are tangents to the circle.
- 5. Draw a circle of radius 3 cm. Draw a triangle with angles 60,60 whose sides are tangents to the circle.

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ഗണിതം

യൂണിറ്റ് നമ്പർ	യൂണിറ്റിന്റെ പേര്	ഊന്നൽ ശ്രദ്ധിക്കേണ്ട പാഠഭാഗങ്ങൾ
1	സമാന്തര ശ്രേണികൾ	■ സമാന്തരശ്രേണി എന്ന ആശയം ■ സ്ഥാനവും പദവും ■ സമാന്തരശ്രേണികളുടെ ബീജഗണിതം ■ എണ്ണൽസംഖ്യകളുടെ തുക ■ പദങ്ങളുടെ തുക (തുകയുടെ ബീജഗണിതം ഒഴികെ)
2	വൃത്തങ്ങൾ	■ അർധവൃത്തത്തിലെ കോൺ ■ ചാപത്തിന്റെ കേന്ദ്രകോണും മറുചാപത്തിലെ കോണും ■ ചക്രീയചതുർഭുജം ■ AB , CD എന്നീ ഞാണുകൾ P യിൽ മുറിച്ചു കടക്കുമ്പോൾ PA x PB = PC x PD ■ PA x PB = PC^2 ■ ചതുരത്തിന് തുല്യ പരപ്പളവുള്ള സമചതുരം
3	സാധ്യതകളുടെ ഗണിതം	■ സാധ്യതയെ സംഖ്യാപരമായി വ്യാഖ്യാനിക്കണം.
4	രണ്ടാംകൃതി സമവാക്യങ്ങൾ	■ രണ്ടാംകൃതി സമവാക്യങ്ങൾ രൂപീകരിക്കണം ■ ചതുരത്തിന്റെ ചുറ്റളവും പരപ്പളവും ഉൾപ്പെടുന്ന വർഗപ്രശ്നങ്ങൾ ■ രണ്ടാംകൃതി സമവാക്യങ്ങൾ ഉൾപ്പെടുന്ന പ്രശ്നങ്ങളുടെ പരിഹാരം (വർഗത്തികവ്)
5	ത്രികോണമിതി	■ 45^0 , 45^0 , 90^0 ; 30^0 , 60^0 , 90^0 കോണളവുകളുള്ള ത്രികോണങ്ങൾ ■ പുതിയ അളവുകൾ (sine, cosine) ■ അകലങ്ങളും ഉയരങ്ങളും (45^0 , 45^0 , 90^0 ; 30^0 , 60^0 , 90^0 എന്നീ കോണുകൾ മാത്രം ഉൾപ്പെടുന്ന പ്രശ്നങ്ങൾ)
6	സൂചകസംഖ്യകൾ	■ സൂചകാക്ഷങ്ങൾ, സൂചകസംഖ്യകൾ എന്നീ ആശയങ്ങൾ. ■ സംഖ്യാജോടികൾ ഉപയോഗിച്ച് ബിന്ദുക്കളുടെ സ്ഥാനങ്ങൾ പറയുന്നു. ■ വശങ്ങൾ അക്ഷങ്ങൾക്ക് സമാന്തരമായ ചതുരത്തിന്റെ മൂലകളുടെ സൂചകസംഖ്യകൾ ■ ബിന്ദുക്കൾ തമ്മിലുള്ള അകലം

7	തൊടുവരകൾ	■ തൊടുവര എന്ന ആശയം ■ വൃത്തത്തിലെ ഒരു ബിന്ദുവിലൂടെയുള്ള തൊടുവര ■ ആരവും തൊടുവരയും ■ വൃത്തത്തിന് പുറത്തുനിന്നുള്ള ഒരു ബിന്ദുവിൽ നിന്നും വൃത്തത്തിലേക്കുള്ള തൊടുവരകൾ
8	ഘനരൂപങ്ങൾ	■ വൃത്തസ്തൂപിക
9	ജ്യാമിതിയും ബീജഗണിതവും	■ മധ്യബിന്ദുവിന്റെ സൂചകസംഖ്യകൾ ■ വരയുടെ ചരിവ്
10	ബഹുപദങ്ങൾ	■ $p(x) = q(x) \times r(x)$ ആയാൽ $p(x)$ ന്റെ ഘടകങ്ങളാണ് $q(x)$, $r(x)$ എന്നിവ ■ $p(x) - p(a)$ യുടെ ഘടകമാണ് $(x - a)$
11	സ്ഥിതിവിവരക്കണക്ക്	■ തരം തിരിക്കാത്ത അളവുകളുടെ മാധ്യം, മധ്യമം

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എസ് എസ് എൽ സി മാതൃകാ ചോദ്യപേപ്പർ 2021

പരമാവധി സ്കോർ : 80 | **ഗണിതം** | **സമയം : 2 $\frac{1}{2}$ മണിക്കൂർ**

നിർദ്ദേശങ്ങൾ

- 20 മിനിറ്റ് സമാശ്വാസ സമയമാണ്. ഈ സമയം ചോദ്യങ്ങൾ വായിക്കാനും ഇഷ്ടമുള്ളവ തിരഞ്ഞെടുക്കാനും ഉത്തരങ്ങൾ ആസൂത്രണം ചെയ്യാനും ഉപയോഗിക്കാം.
- ഓരോ ചോദ്യവുമായി ബന്ധപ്പെട്ട നിർദ്ദേശങ്ങൾ വായിച്ച് മനസ്സിലാക്കി ഉത്തരമെഴുതുക.
- ഉത്തരമെഴുതുമ്പോൾ സ്കോർ, സമയം എന്നിവ പരിഗണിക്കണം.
- 1 മുതൽ 45 വരെയുള്ള ചോദ്യങ്ങൾക്ക് പരമാവധി ലഭിക്കുക 80 സ്കോർ ആയിരിക്കും.
- ചോദ്യത്തിൽ പ്രത്യകം ആവശ്യപ്പെട്ടിട്ടുള്ള സന്ദർഭങ്ങളിൽ മാത്രം π , $\sqrt{2}$ $\sqrt{3}$ എന്നിവയുടെ ഏകദേശവില ഉപയോഗിച്ച് ലഘൂകരിച്ചാൽ മതി.

1 മുതൽ 5 വരെയുള്ള ഓരോ ചോദ്യത്തിനും 1 സ്കോർ വീതം. (ബ്രാക്കറ്റിൽ നിന്നും ശരിയായ ഉത്തരം തെരഞ്ഞെടുത്തെഴുതുക.)

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6 മുതൽ 10 വരെയുള്ള ഓരോ ചോദ്യത്തിനും 2 സ്കോർ വീതം.

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11 മുതൽ 20 വരെയുള്ള ഓരോ ചോദ്യത്തിനും 3 സ്കോർ വീതം.

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21 മുതൽ 30 വരെയുള്ള ഓരോ ചോദ്യത്തിനും 4 സ്കോർ വീതം.

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31 മുതൽ 45 വരെയുള്ള ഓരോ ചോദ്യത്തിനും 5 സ്കോർ വീതം.

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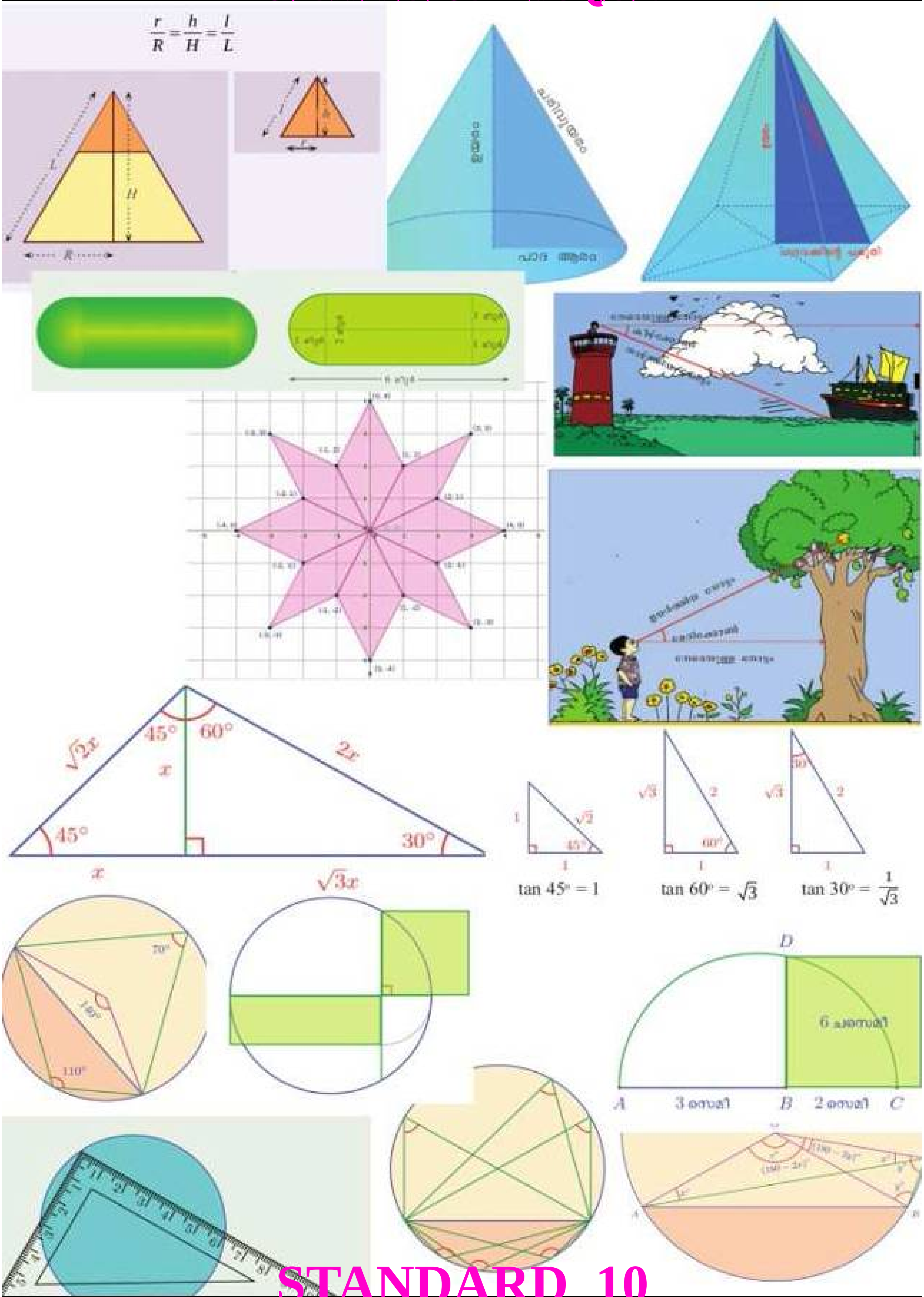
ഗണിതശാസ്ത്രം



STANDARD 10