By Pythagorean theorem, for a right angle triangle,

$$z^2 = x^2 + y^2.$$

If $z^2 > x^2 + y^2$, the angle formed is an obtuse angle.

If $z^2 < x^2 + y^2$, the angle formed is an acute angle.

- Sides of the triangles should satisfy the 3 conditions of inequalities.
- → **AC < AB + BC**
- → **AB < AC + CB**
- → **BC < AB + AC**

For example : abc is a triangle with ac = x+5 , bc= x , ab = 20-x, angle opp to ac and bc acute , wh is value of x??

- Sides of the triangles should satisfy the 3 conditions of inequalities.
- $\rightarrow$ **AC < AB + BC**
- $\rightarrow$ **AB < AC + CB**
- $\rightarrow$ **BC < AB + AC**

- Lets check for these conditions.

$\rightarrow$ $\mathbf{(x+5) < x + 20 - x}$

$\mathbf{x + 5 < 20}$

$\mathbf{x < 15}$ **----------(1)**

$\rightarrow$ (20 – x) < x + 5 + x

20 – x < 2x + 5

-3x < -15

3x > 15

x > 5 ---------------(2)

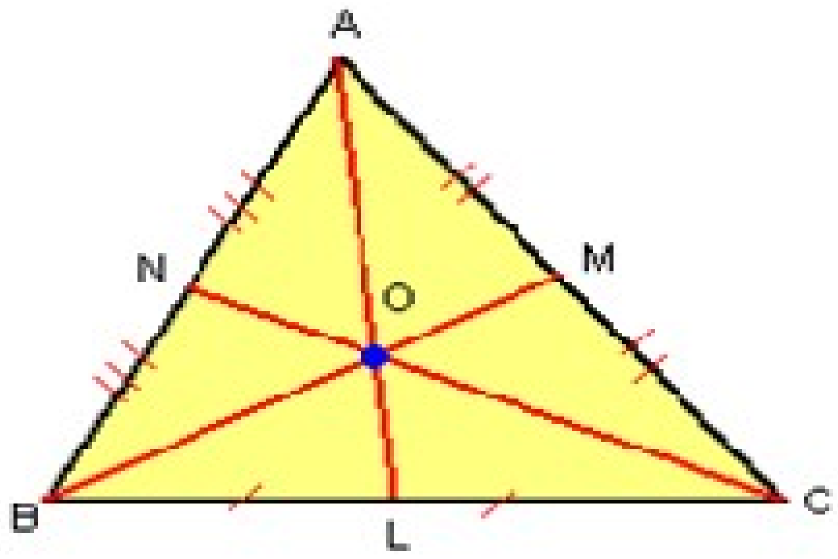
$\rightarrow$ x < 20 – x + x + 5

x < 25---------------(3)

Hence, the value of x should satisfy all the 3 requirements.

With this, we can say, x can vary from 6 to 24.

- **MEDIAN**
- A **median** of a triangle is a line joining a vertex to the midpoint of the opposing side .
- **CENTROID**
- A centroid of a triangle is a point where all the three medians of the triangle meet.



Properties:

A centroid of the triangle divides the median in the ratio of 2:1.

In the above figure

AL, BM and CN are the medians of Triangle ABC.

Hence BL = LC,

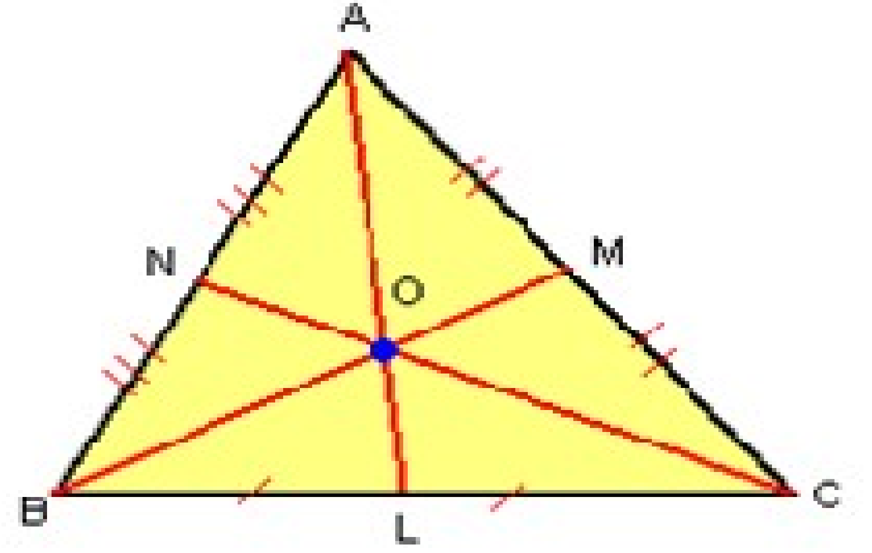
AM = MC and AN = NB.

O is the centroid of the triangle.

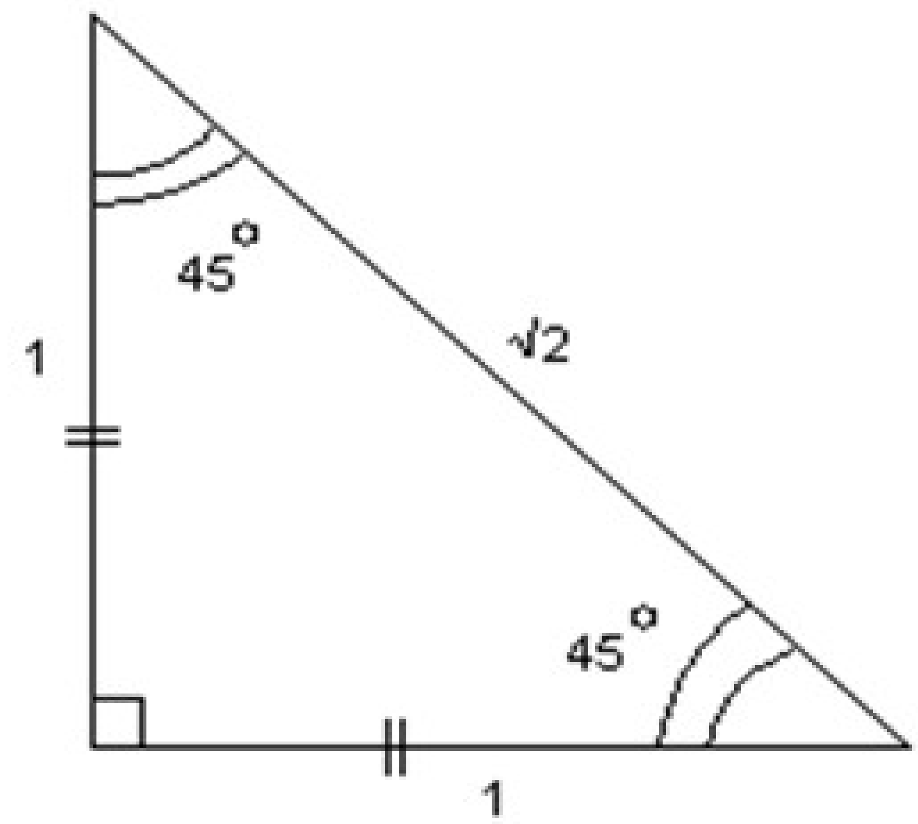
AO : OL = 2 : 1

BO : OM = 2 : 1

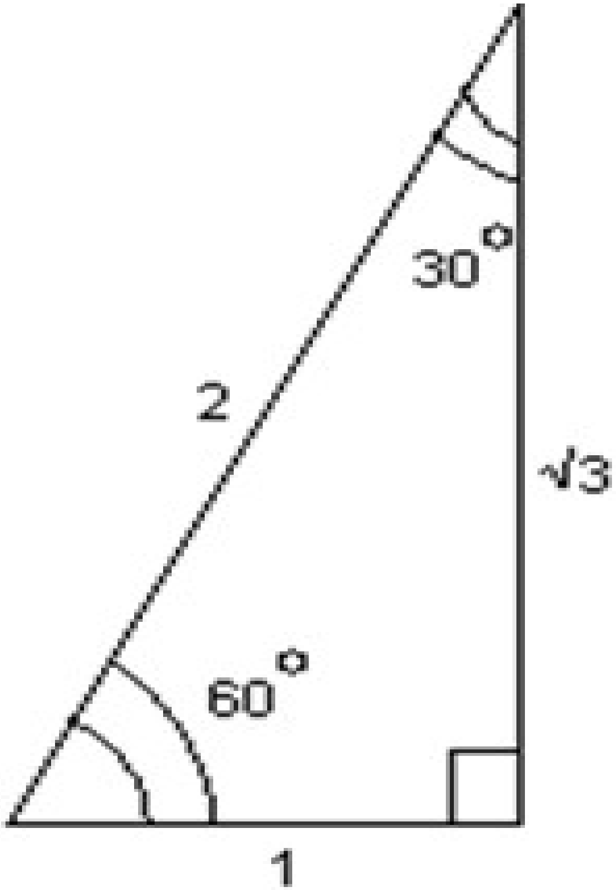
CO : ON = 2 : 1



- The ratio of the sides of 45-45-90 right angled triangle is 1 : 1 : √**2.**



- The ratio of the sides of 30-60-90 right angled triangle is **1 : √3 : 2.**



Sum of the Interior or internal angle of an n-gon

$(n-2) * 180$

Measure of each interior or internal angle of a regular polygon

$(n - 2) \times 180^\circ \ / \ n$

Sum of the exterior angles of n-gon is 360º

The measure of each exterior angle of a regular polygon is 360º/ n

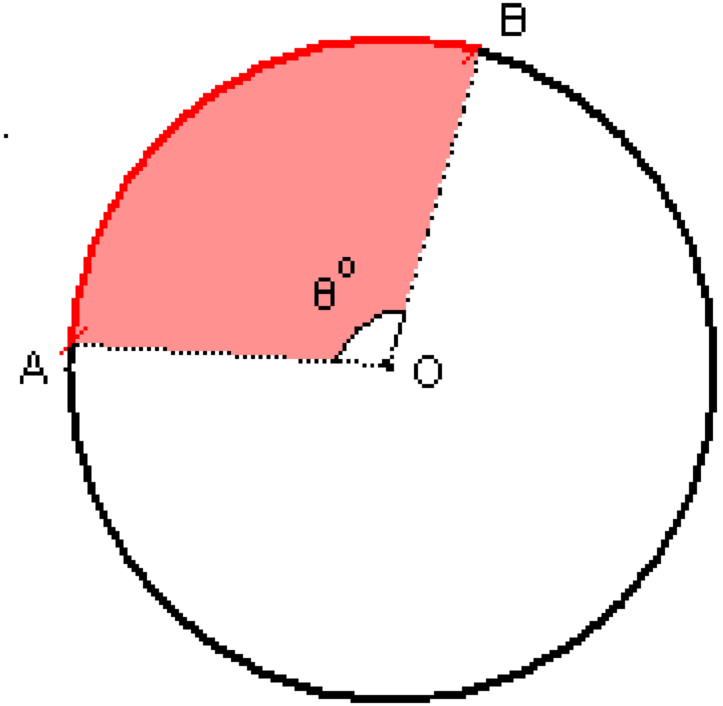
Sum of the external angles of the polygon

$(n+2) * 180^{\circ}$

Length of the arc

(where θ is the angle formed by the arc)

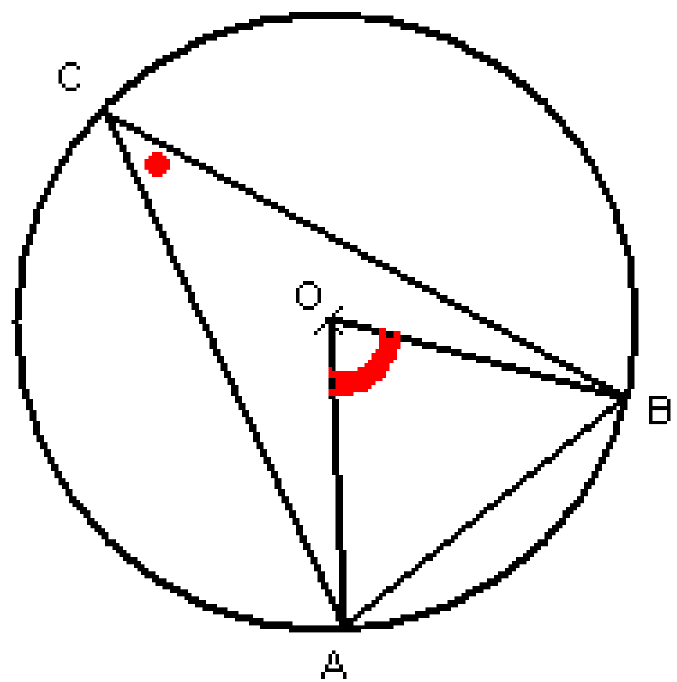
$2\pi r \times (\theta / 360)$



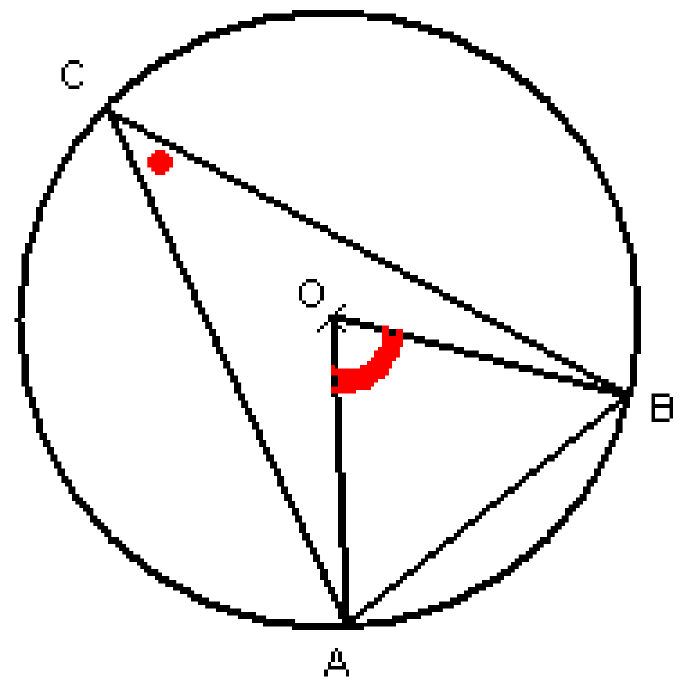
Area of the sector (where θ is the angle f

$$= \pi r^2 (\theta / 360)$$

- Central angle: Given a chord say AB in a circle and if O is the center of the circle then ∟AOB is known as the central angle subtended by the chord AB.

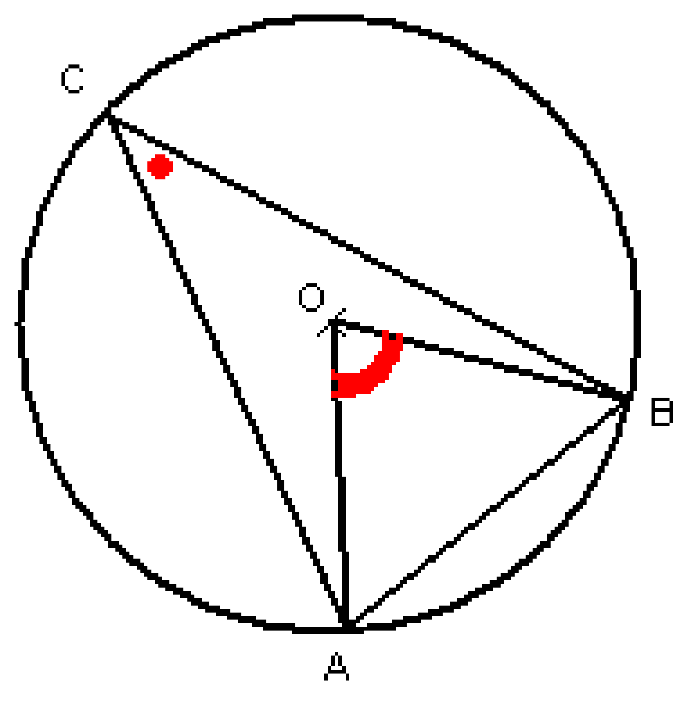


- Inscribed angle: Given a chord say AB in a circle and if O is the center of the circle ∟ACB is known as the inscribed angle subtended by the chord AB



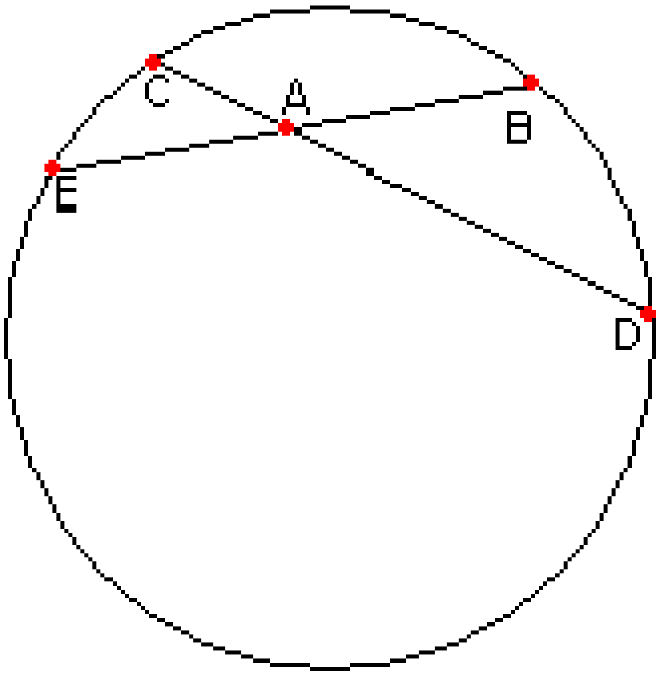
- Central angle subtended by the chord will always be twice as the inscribed angle subtended by the same chord.

→ ∟AOB = 2 ∟ACB



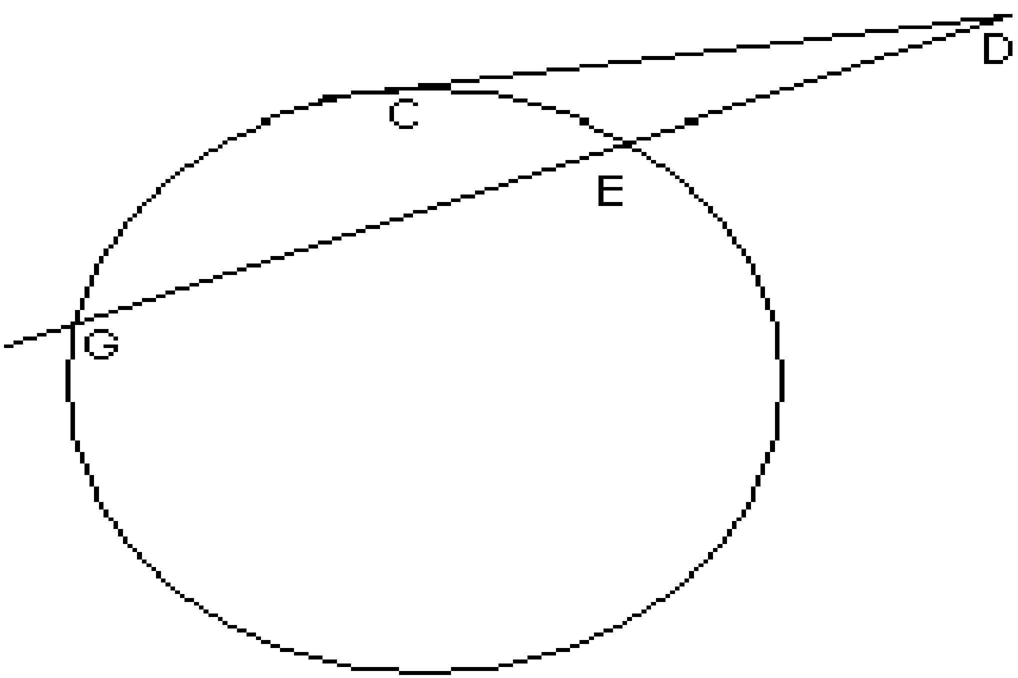
If two chords, CD and EB, intersect at A, then

$$CA \times DA = EA \times BA.$$

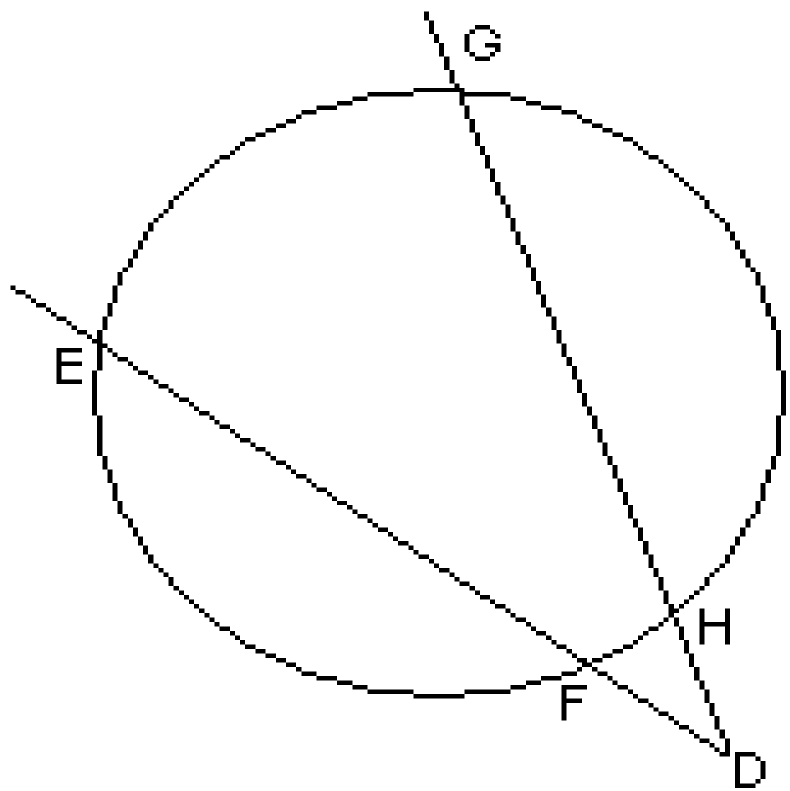


- If a tangent from an external point D meets the circle at C and a secant from the external point D meets the circle at G and E respectively, then

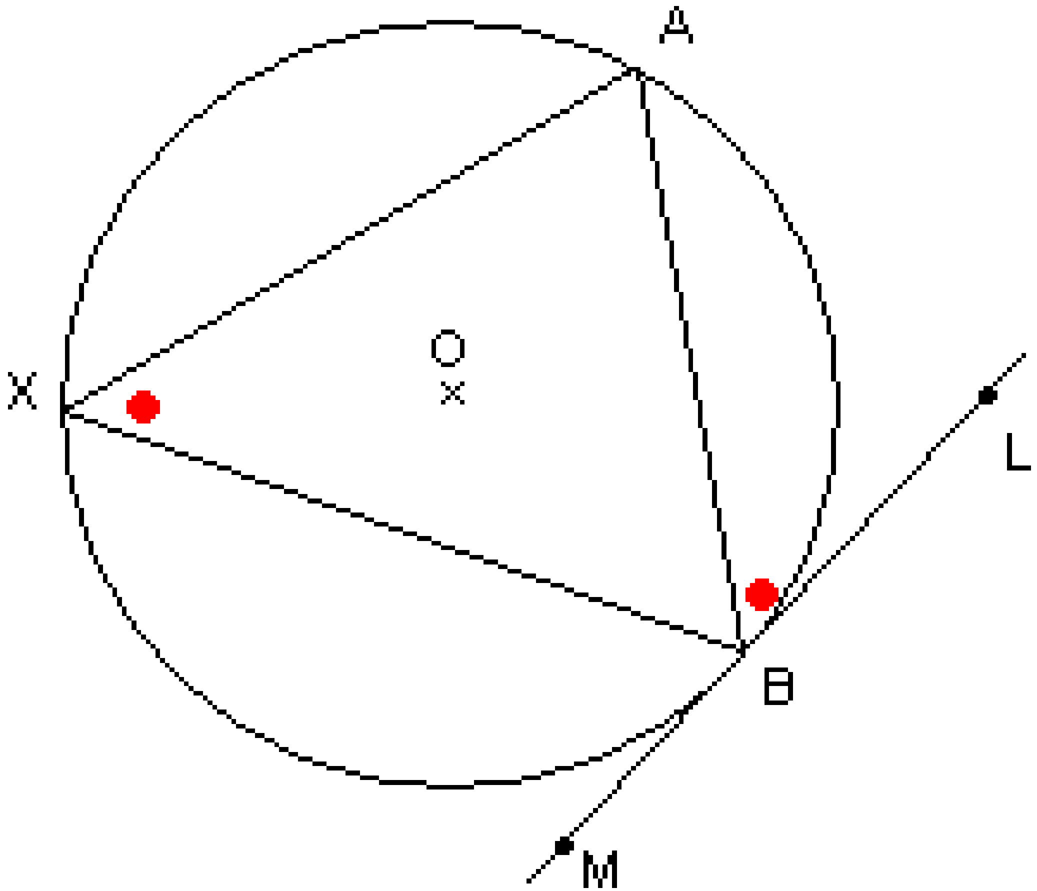
$$DC^2 = DG \times DE.$$



- If two secants, DG and DE, also cut the circle at H and F respectively, then $DH \times DG = DF \times DE$.



- The angle between a tangent and chord is equal to the subtended angle on the opposite side of the chord.



Distance between two points (x , y) and (x1 , y1) will be

$$\sqrt{(x - x1)^2 + (y - y1)^2}$$

Slope when two points $(x1,y1)$ and $(x2,y2)$ are given

$$\text{Slope} = (y2 - y1) / (x2 - x1)$$

Slope when x-intercept “a” and y-intercept “b” are given

$$\text{Slope} = -b/a$$

- Equation of the line

→ One point form : when one point and slope is given

$$y = mx + c$$

→ Two point form : when two points $(x1,y1)$ and $(x2,y2)$ are given

$$(y - y1) = m(x - x1)$$

where , m = slope = $(y2 - y1) / (x2 - x1)$

→ Intercept form : when x-intercept "a" and y-intercept "b" are given

$$x/a + y/b = 1$$