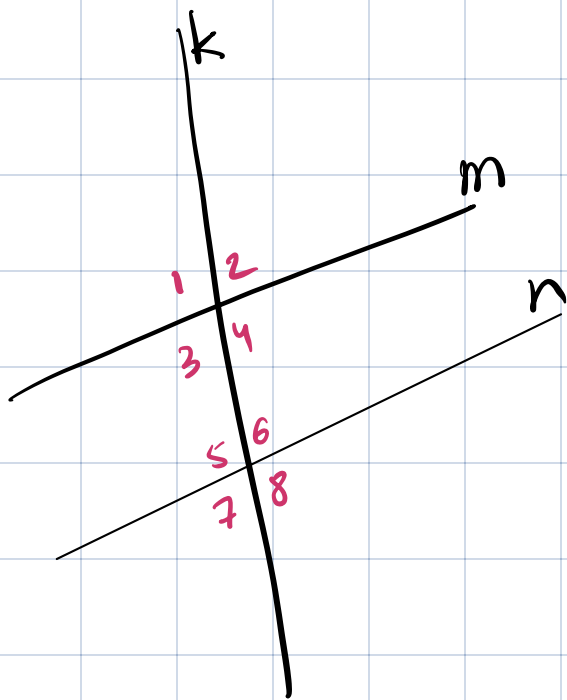




equal angles
corresponding $\angle 1 = \angle 5$
 $\angle 2 = \angle 6$
 $\angle 3 = \angle 7$
 $\angle 4 = \angle 8$

vertical $\angle 2 = \angle 3$
 $\angle 1 = \angle 4$
 $\angle 6 = \angle 7$
 $\angle 5 = \angle 8$

alternate
interior $\angle 3 = \angle 6$
 $\angle 4 = \angle 5$
exterior $\angle 1 = \angle 8$
 $\angle 2 = \angle 7$

angles "sum up to 180°"

adjacent

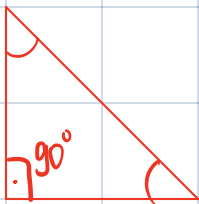
$\angle 2$ & $\angle 4$ $\angle 1$ & $\angle 2$
 $\angle 1$ & $\angle 3$ $\angle 3$ & $\angle 4$
 $\angle 5$ & $\angle 7$ $\angle 5$ & $\angle 6$
 $\angle 6$ & $\angle 8$ $\angle 7$ & $\angle 8$

interior

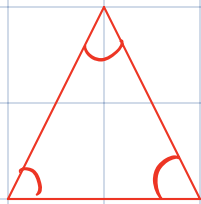
$\angle 3$ & $\angle 5$
 $\angle 4$ & $\angle 6$

Triangles

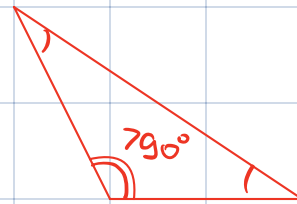
$$\angle 1 + \angle 2 + \angle 3 = 180^\circ$$



right Δ

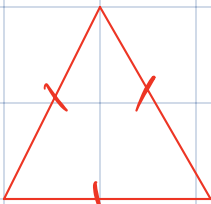
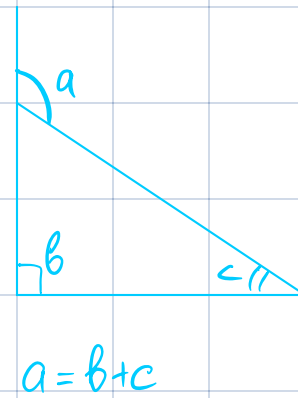
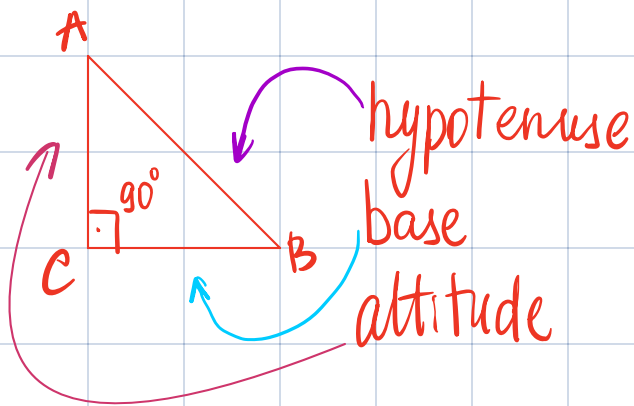


$< 90^\circ$
acute Δ

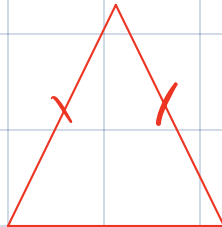


obtuse Δ

Right triangles



equilateral



isosceles



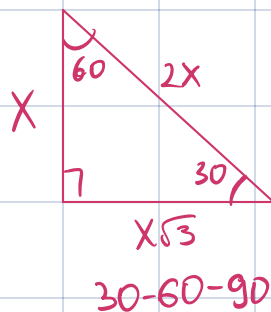
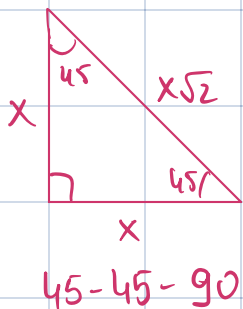
scalene

If p , then q

If q , then p - converse

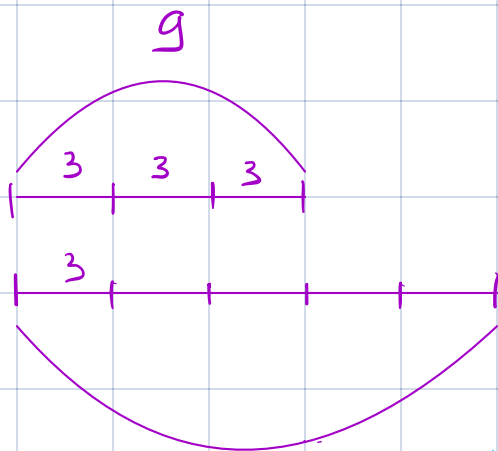
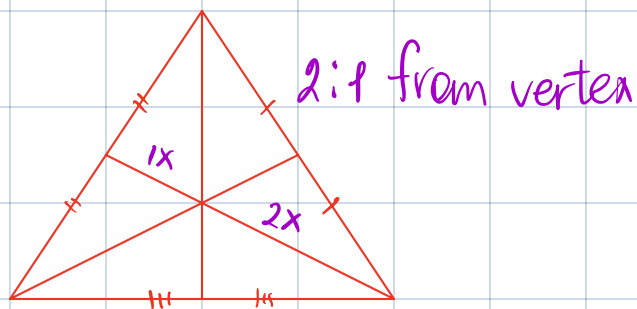
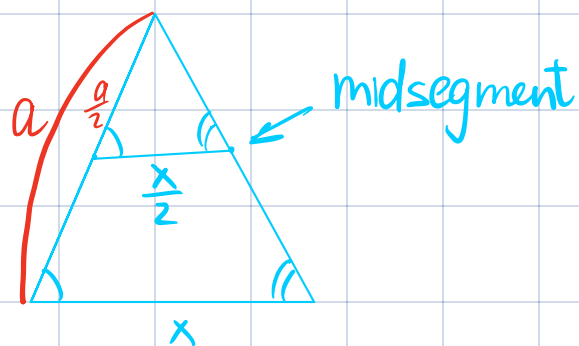
If not p , then not q - inverse

If not q , then not p - contrapositive



To form a triangle

$$a + b > c$$



15 because the parts are the same so 5 parts, 3 each.

$$\text{If } k = 3:1 \Rightarrow \frac{A_1}{A_2} = k^2 (9:1)$$

Equality criteria:

SSS HL

SAS

ASA

AAS

Similarity criteria:

AA

SAS

SSS

SOM CAH TOA

$$\sin x = \frac{O}{H} \quad \cos x = \frac{A}{H} \quad \tan x = \frac{O}{A}$$

$$c^2 = a^2 + b^2$$

↑
hypotenuse

↖ ↗
legs

Good right triangles

$$3-4-5$$

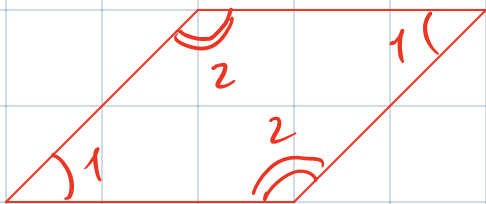
$$6-8-10$$

$$5-12-13$$

$$\tan(45) = 1$$

$$\sin(90) = 1 \quad \sin(270) = -1$$

$$\cos(0) = 1 \quad \cos(180) = -1$$



$$\angle 1 + \angle 2 = 180^\circ$$

$$\angle 1 + \angle 2 + \angle 1 + \angle 2 = 360^\circ$$

Sum of the interior angles: $180(n-2)$

Each angles: $\frac{180(n-2)}{n}$

Sum of the exterior angles: 360°

One exterior angles: $\frac{360}{n}$

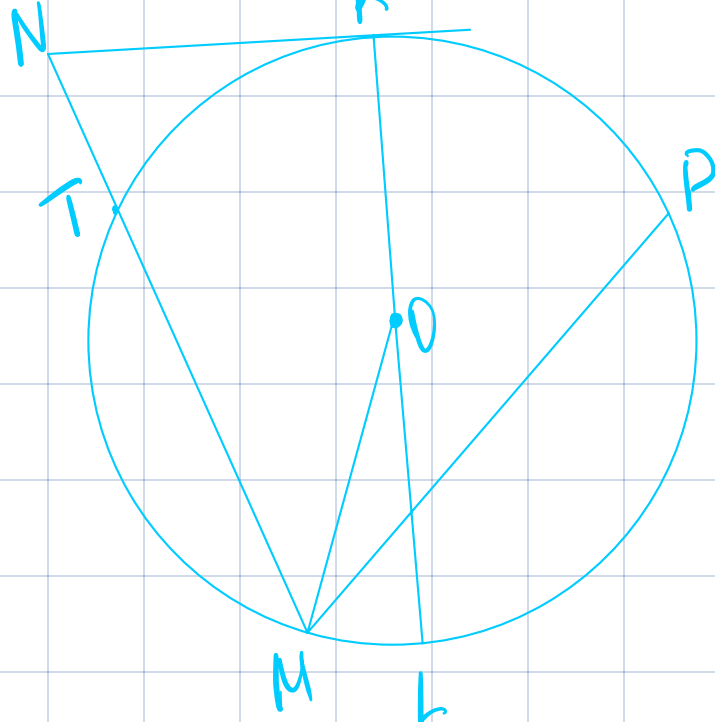
n -amount of angles

$$\text{Circumference} = 2\pi r$$

$$\text{Area} = \pi r^2$$

$$\text{Area of the part} = \frac{n}{360} \cdot \pi r^2$$

$$\text{Circumference of the part} = \frac{n}{360} \cdot 2\pi r$$



OK - radius

KL - diameter

TM - chord

NT - secant

NK - tangent

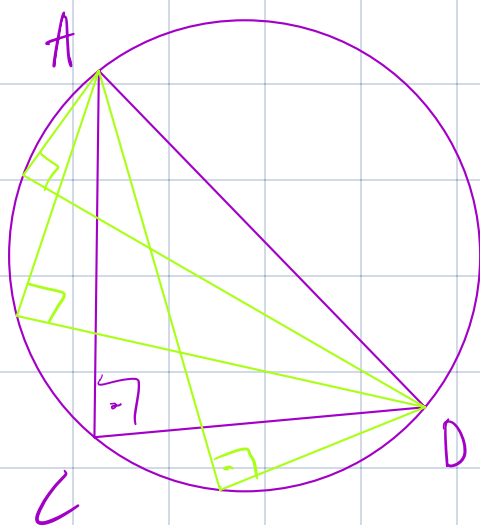
$\angle MOL$ - central angle

$\angle TMP$ - inscribed angle

$\widehat{KP}$ - minor arc

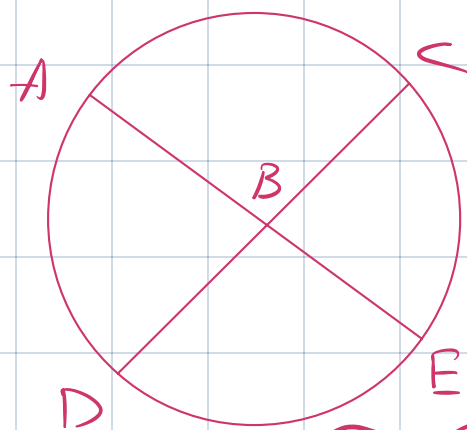
$\widehat{KTP}$ - major arc

$\widehat{KL}$ - semicircle

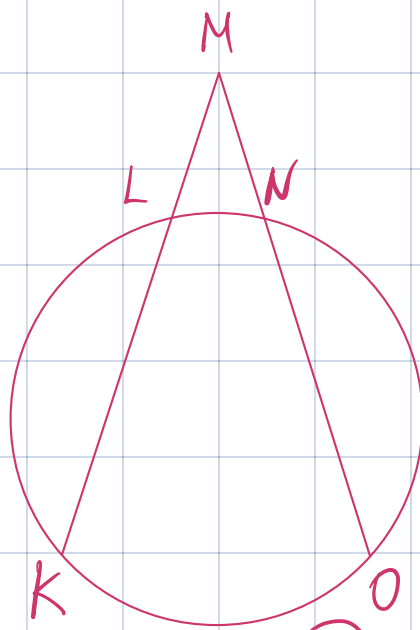


AD - diameter $\Rightarrow \angle ACD = 90^\circ$

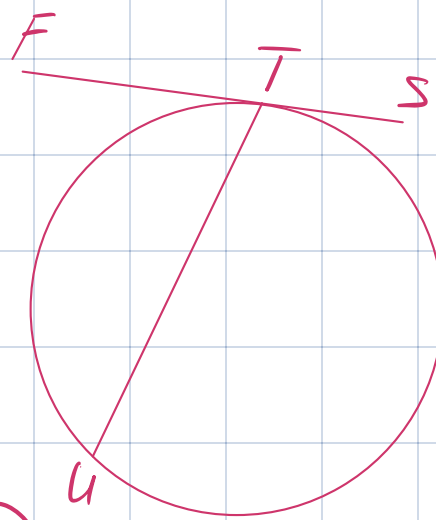
all green angles are 90° as well



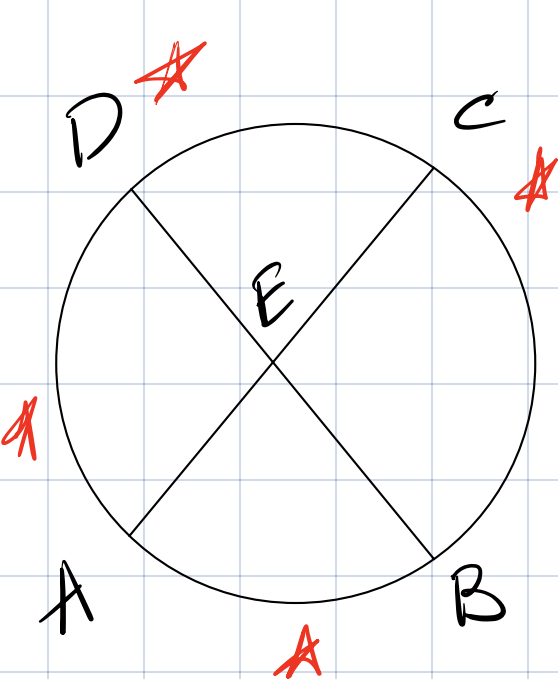
$$\angle ABD = \frac{\widehat{AD} + \widehat{CE}}{2}$$



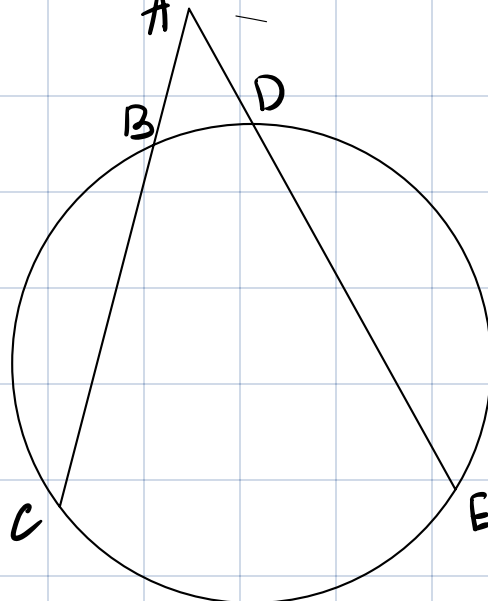
$$\angle LMN = \frac{\widehat{KP} - \widehat{LN}}{2}$$



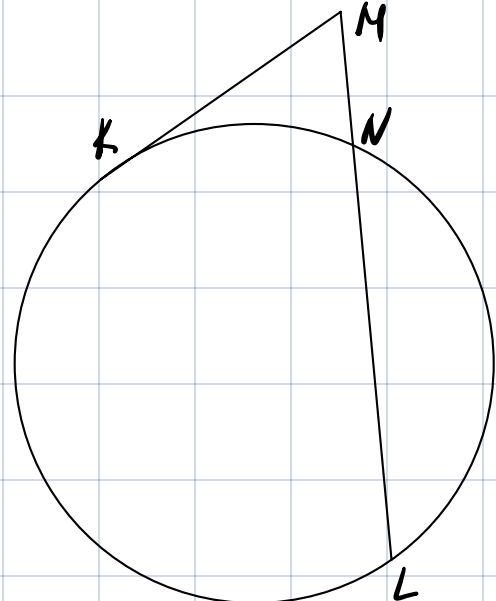
$$\angle FTU = \frac{1}{2} \widehat{TU}$$



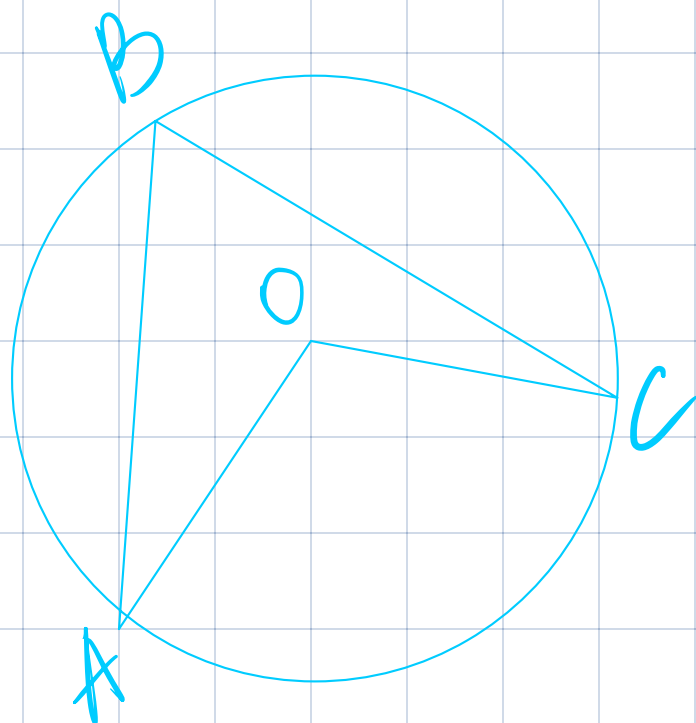
$$AE \cdot EC = BE \cdot ED$$



$$AB \cdot AC = AD \cdot AE$$



$$KM^2 = MN \cdot ML$$



O-center $\Rightarrow$
AOC - central $\angle$

$\angle ABC$ and $\angle AOC$
have the same
arc so

$$\angle ABC = \frac{1}{2} \angle AOC$$

Equation of circle:

$$(x-h)^2 + (y-k)^2 = r^2$$

(h, k) - centre

r - radius

$$x^2 + y^2 = r^2 \Rightarrow (h, k) = (0, 0)$$

$$\text{Midpoint formula} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

$$\text{slope : } m = \frac{y_2 - y_1}{x_2 - x_1}$$

if slope = k then for perpendicular line the slope will be $-\frac{1}{k}$
parallel line have the same slope

(a, b) counterclockwise
 90° rotation $\Rightarrow (-b, a)$
 180° rotation $\Rightarrow (-a, -b)$
 270° rotation $\Rightarrow (b, -a)$

(a, b) clockwise
 90° rotation $\Rightarrow (b, -a)$
 180° rotation $\Rightarrow (-a, -b)$
 270° rotation $\Rightarrow (-b, a)$

reflection over the line $y=x$:
 $(a, b) \Rightarrow (b, a)$

Area of a trapezoid: $\frac{b_1 + b_2}{2} \cdot h$
(b_1 and b_2 are the parallel sides)

Area of a regular pentagon: $\frac{P \cdot a}{2}$
(a - apothem)

Area of a cone: $\frac{1}{3} \pi r^2 h$

Area of a sphere: $\frac{4}{3} \pi r^3$

The lateral surface area: $2\pi r h$

length ratio $a:b \Rightarrow$ area ratio $a^2:b^2 \Rightarrow$
volume ratio $a^3:b^3$