

Right angle
 $= 90^\circ$

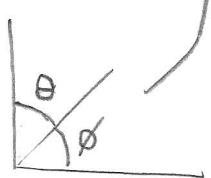
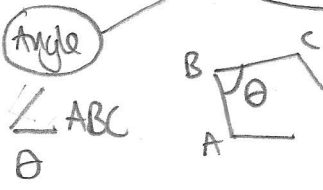
Acute angle
 $\theta < 90^\circ$

Obtuse angle
 $90^\circ < \theta < 180^\circ$

Straight angle
 $\theta = 180^\circ$
 360° is a "full angle"

Reflex angle
 $\theta > 180^\circ$ but less than 360°

Definitions

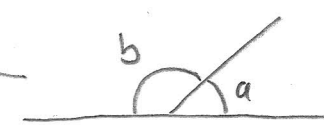


If $\theta + \phi = 90^\circ$ then θ and ϕ are complementary angles

POINTS
 NETS
 LINES
 PLANES
 SOLIDS

Geometry 1

If $a + b = 180^\circ$ then a and b are supplementary angles



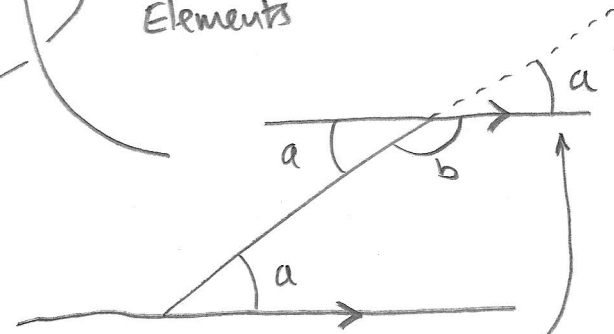
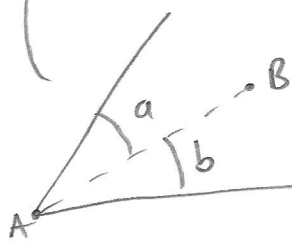
Carnot, Möbius, Bolyai, Lobachevsky, Riemann, ...

Famous mathematicians
 Archimedes
 Apollonius
 Descartes
 "Calculus"
 Euler

Euclid
 ↓
 Elements

Pythagoras

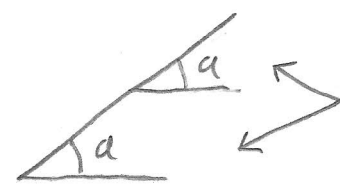
a and b are adjacent
 - common side AB
 - common vertex A



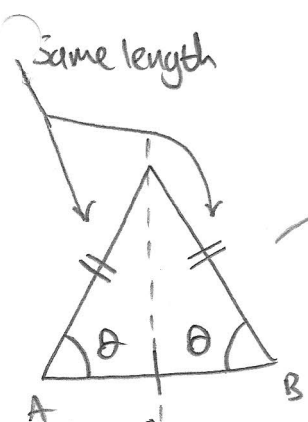
a Alternate angles

a and b are allied angles

parallel lines



Corresponding angles
 (Translation of the same geometry)

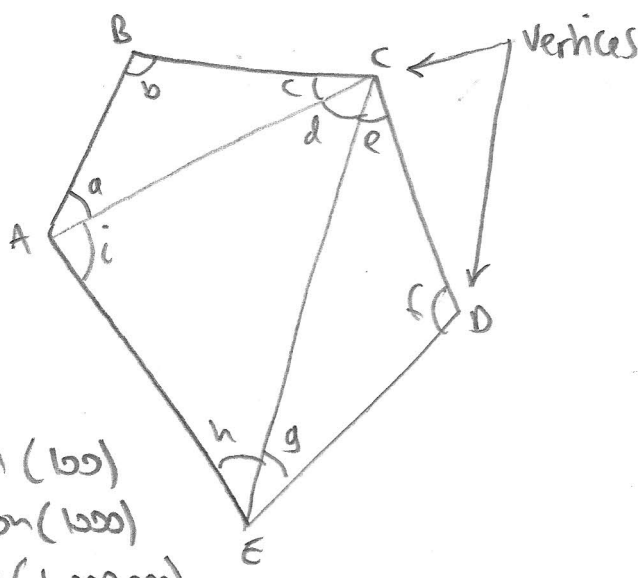


Isosceles triangle

Midpoint of AB

line of symmetry

- Triangle 3
- Square 4
- Pentagon 5
- Hexagon 6
- Heptagon 7
- Decagon 10
- Dodecagon 12
- Octagon 8
- Nonagon 9
- hendecagon 11

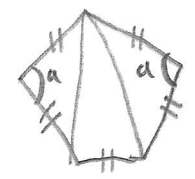


A polygon of N sides can be divided into triangles. Since the sum of the internal angles of a triangle = $180^\circ \Rightarrow$ sum of the internal angles of a polygon = $180^\circ \times \# \text{ triangles}$.

- hectagon (100)
- chiliagon (1000)
- Megagon (1,000,000)
- circle (∞)

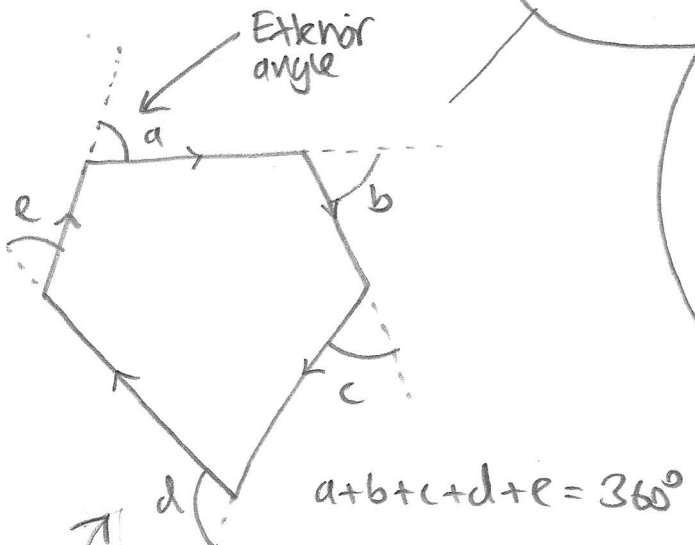
Geometry 2

eg regular pentagon
Sides all the same length



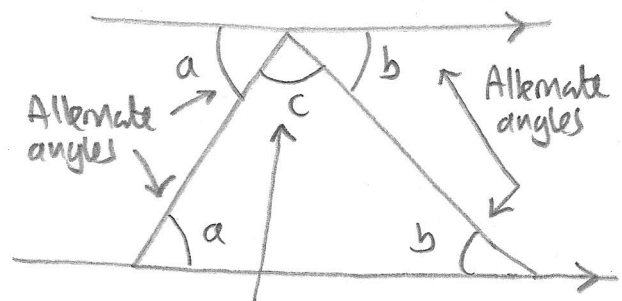
$$5a = 180 \times 3$$

$$\Rightarrow a = \boxed{108^\circ}$$



Proof that a triangle has internal angles which sum to 180°

So if exterior angle is 60°
 $\Rightarrow N = \frac{360^\circ}{60^\circ} = 6$
HEXAGON

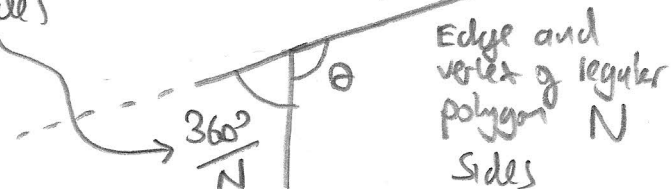


$$a + b + c = 180^\circ \text{. Viola!}$$

Think of the edges of a polygon as vectors joined end to end. They complete a full circle so the sum of the exterior angles must be 360°

If N sides

$$\theta = 180 - \frac{360}{N}$$



INTERNAL ANGLE θ OF A MEGAGON ($N=10^6$) = $180 - \frac{360}{10^6}$