

Chapter 3 : Basis of Geometry (book p.144)

Bring your book, ruler, compass and set square.

VII. Point and straight line.

A point is a « place » so accurate and so small that its size is zero.
We represent it by drawing a cross on it.
A point's name is always a capital letter.

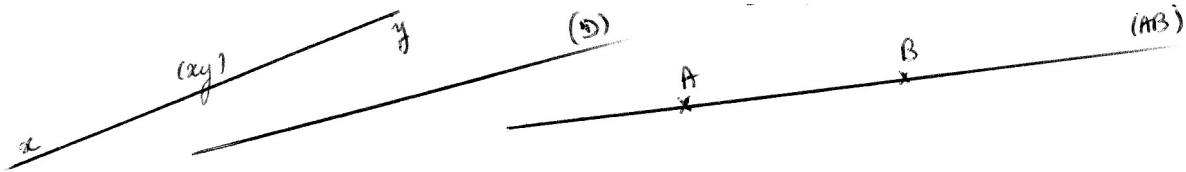


A straight line is formed by an infinity of points in single file, like a file of ants or like elephants (only very, very small!).

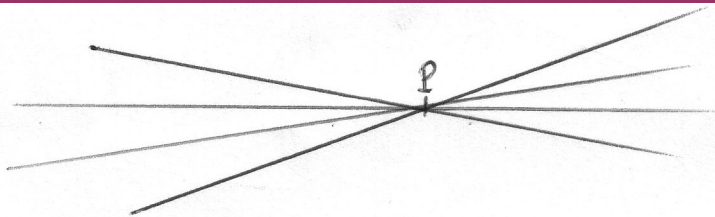
A straight line is infinite « on both sides »; therefore it has no length (or an infinite length), and no middle!

A straight line's name is written inside brackets.

You might encounter those different notations : the straight line (xy) (*small letters*, « names of the two infinite bounds ») ; straight line (D) ; straight line (AB) (it's the straight line that passes by the points A and B; A and B shall be in capital, because they are points' names) :

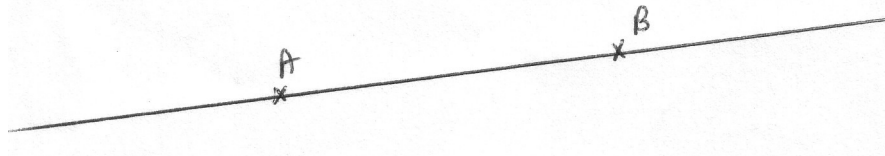


Pty 1 : There's an infinity of straight lines passing by a given point.



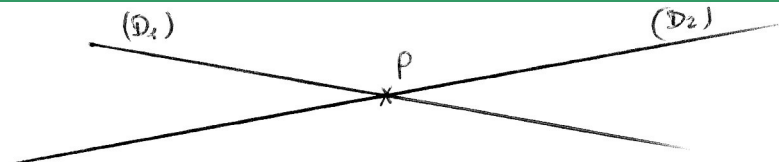
Pty 2 : There's only one straight line passing by two given points.

(That's why we can call it « the straight line (AB) »).



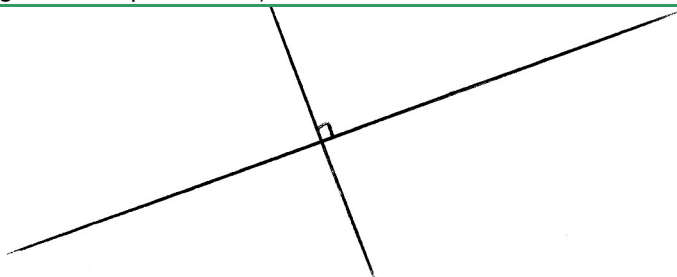
VIII. Secant straight lines, parallels, perpendiculars.

Def 1 : Two secant straight lines are two lines that cross each other, they have one common point, called point of intersection.



Def 2 : Two perpendicular straight lines are specific secant lines : they cross each other forming a right angle (angle of 90°).

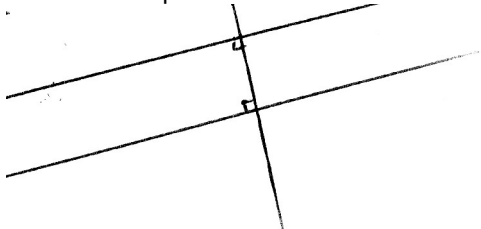
(90 degrees is a quarter turn)



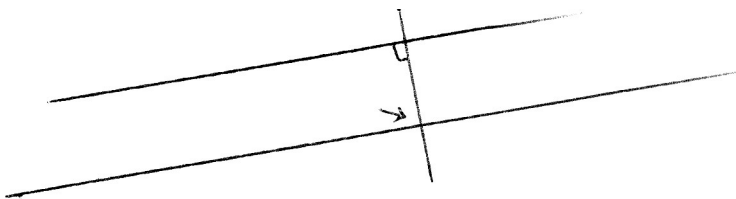
Def 3 : Parallel straight lines have no common point at all : they never cross each other, they are not secant (you can imagine a train's rails).



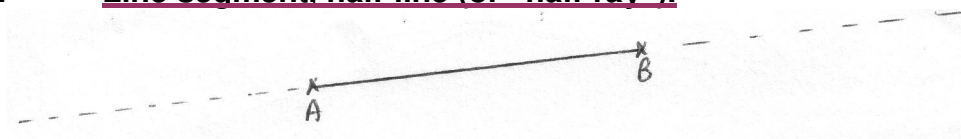
Pty 3 : If two straight lines are perpendicular to the same third line, then they are parallel to each other.
Construction p.150.



Pty 4 : If two straight lines are parallel, then any line perpendicular to the first is also perpendicular to the second.



IX. Line segment, half-line (or "half-ray").



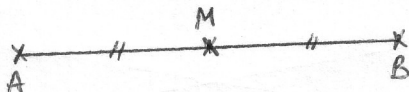
The line segment bounded by the points A and B is written [AB].

Def 4 : A line segment is a portion of straight line, bounded by two points (called boundaries).
The name of a segment shall be written inside square brackets.

A line segment isn't infinite, so it has a length that you can for example measure with a ruler.
The length of a line segment shall be written without square brackets.

The length of the line segment [AB] is written AB. On the drawing above, AB =cm.

Def 5 : The middle point of a line segment is the point located on this line segment, at the same distance from each boundary.



If you call M the middle point of the line segment [AB], you shall have $AM=MB$ (equality between lengths).

Def 6 : A half-line (or « half-ray ») is a portion of a straight line extending from a point (called its « origin ») and infinite in the other direction.
The name of a half-line is written between a square bracket and a bracket.

Since a half-line is infinite in one direction, it has neither middle point, nor length.

