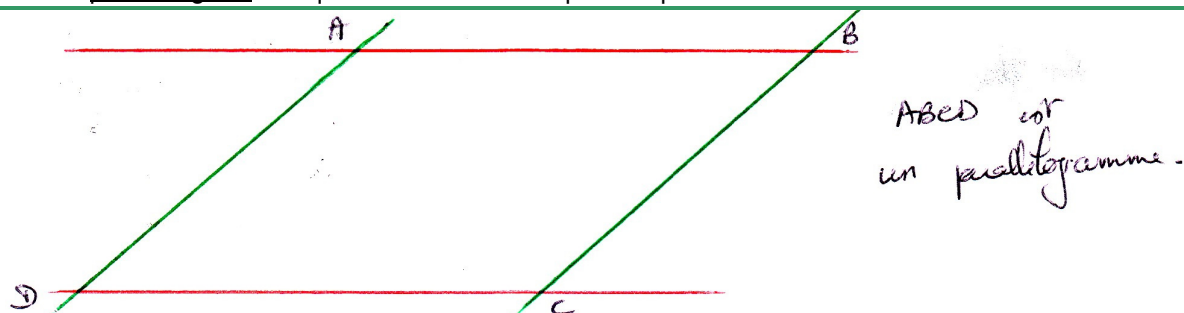# Chapter 4: Parallelogram.
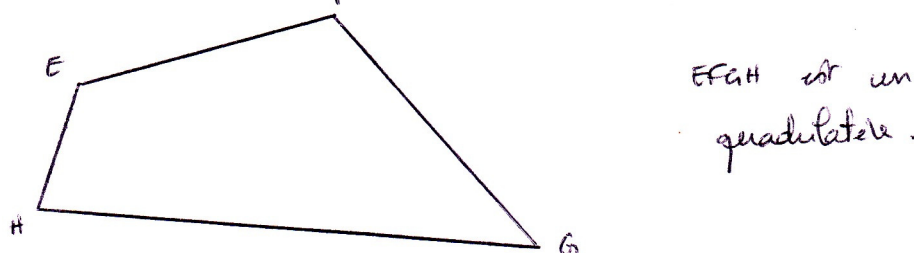
I. Parallelogram: definition and properties.

Def 1: A parallelogram is a quadrilateral with two pairs of parallel sides.

Attention: big mistake: do not mix up parallelograms and quadrilaterals : a quadrilateral has 4 sides with absolutely no particularity a priori.
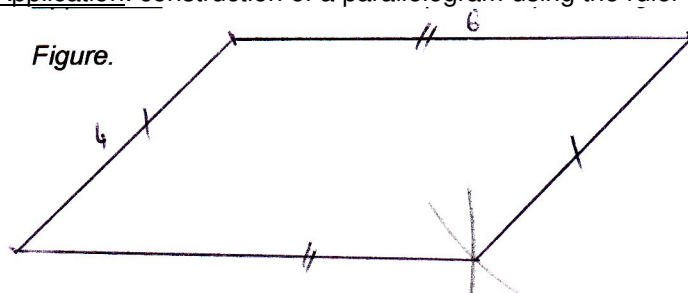
Pty 1: If a quadrilateral is a parallelogram, then his opposite sides are equal in length.

Pty 1': If the two pairs of opposite sides of a quadrilateral are equal in length, then it's a parallelogram.

Comment: Pty 1' is the reverse of Pty 1.

Application: construction of a parallelogram using the ruler and compass.

Figure.

Pty 2: If a quadrilateral is a parallelogram, then his diagonals bisect* each other.
Each diagonal crosses the other in its midpoint.

Pty 2': If the diagonals of a quadrilateral bisect each other, then it's a parallelogram.

Comment: The point where the diagonals cross each other is the symmetry centre of the parallelogram.
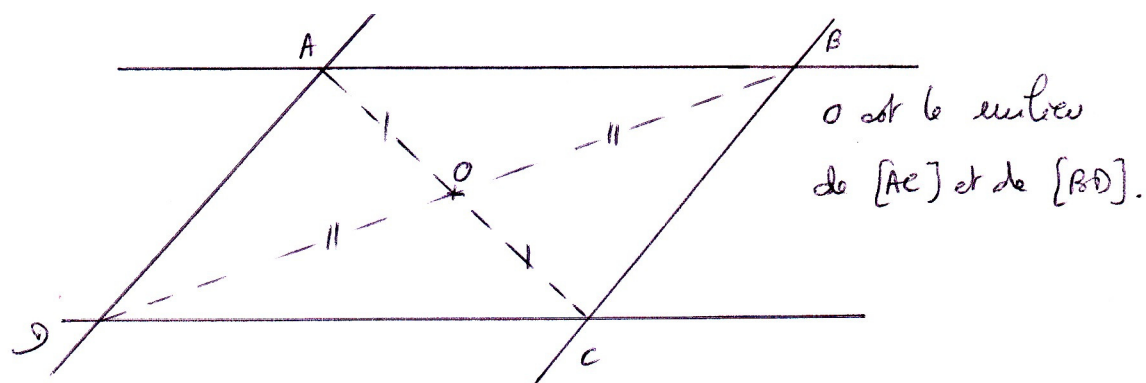
Pty 3: I f a quadrilateral is a parallelogram, then its opposite angles are equal in measure

récíproque de cette propriété n'est pas
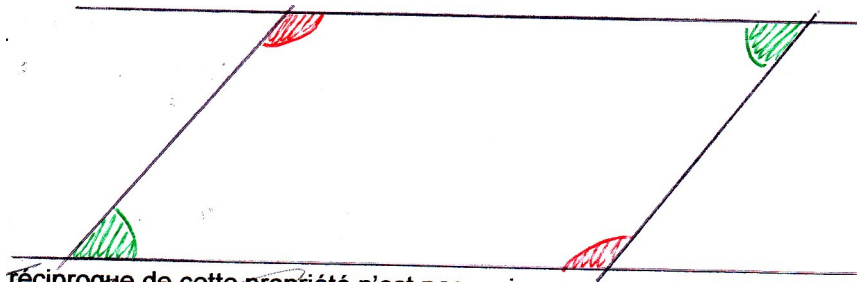
II.   Area of a parallelogram.

http://www.mathgoodies.com/LESSONS/vol1/area_parallelogram.html

Def 2: In a parallelogram ABCD, a height with respect to the side [AB] is a segment line, perpendicular to [AB], that joins [AB] and its opposite side [CD].
The length of this segment line is also called "height".

hauteur relative au côté [AB].

+ 1 figure a côté ordas
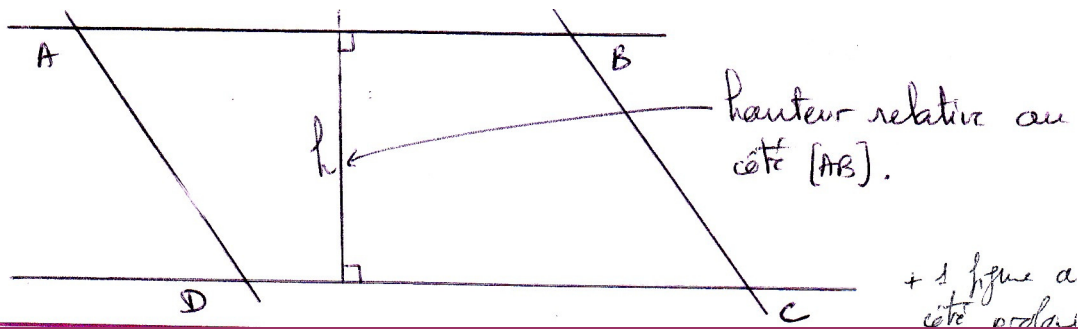
Pty 4: To calculate the area of a parallelogram you use the length "c" of one of its sides, and the length "h" of the height with respect to that side, in the formula: $A = c \times h$.

$$A = c \times h.$$