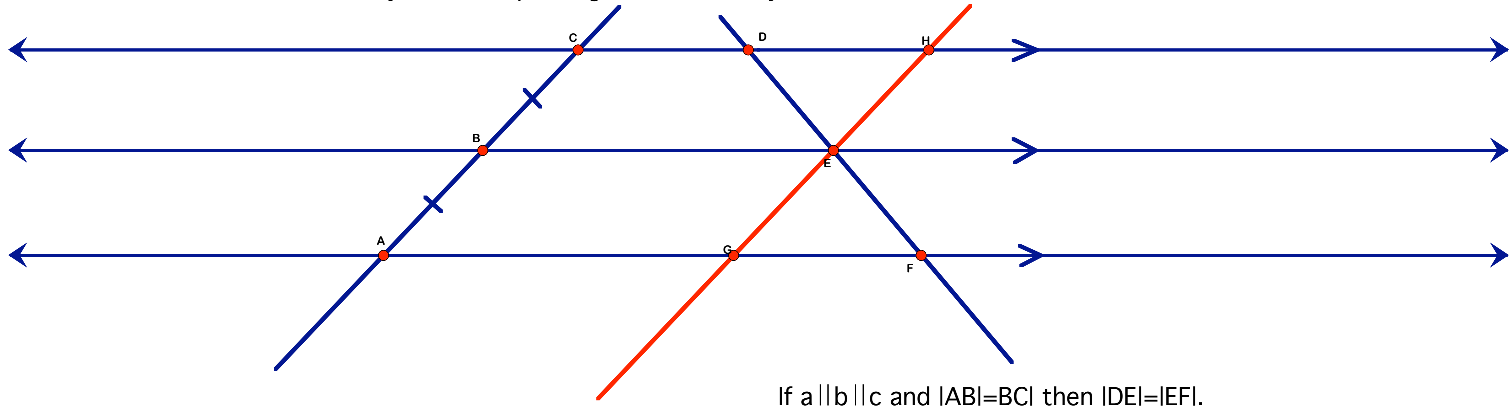
Theorem 34. (Thales Theorem).
If parallel lines a and b cut off equal segments from a transversal line c, then they cut off equal segments from any other transversal line.



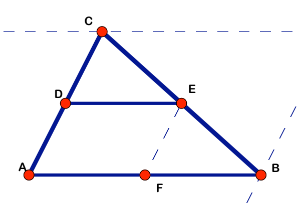
If a||b||c and |AB|=BC| then |DE|=|EF|.

Proof:

Statements:			Reason: Hide Objects
1. Draw a line || to AC through the point E.			1. Axiom 5.1.
2. |GE|=|AB|.	Hide Caption	Hide Caption	2. ABEG is a parallelogram, hence by Th 25, opposite sides are equal.
3. |EH|=|BC|	Hide Caption	Show Caption	
4. |AB|=|BC|	Hide Caption	Hide Caption	4. Given.
5. |GE|=|EH|	Hide Caption	Hide Caption	5. Follows from 2,3,4.
6. ∠DEH=∠FEG	Hide Caption	Hide Caption	6. Vertical angles.
7.∠EGF=∠EHD	Hide Caption	Hide Caption	7. Line DH||EF , and angles are alterneting interior.
8. △EGF≅△EHD	Hide Caption	Hide Caption	8. ASA.
9.|EF|=|ED|	Hide Caption	Hide Caption	9. Converse of SSS. If two triangles are congruent then their corresponding sides are equal.

Theorem 35. If points D and E are the midpoints of the sides AC and BC of the △ABC, then
a) DE||AB
b) $|DE|=\frac{1}{2}|AB|$

Hide Objects



Proof of a).

Statements:		Reason
1. Draw a line through the point D || AB.	1	1. Axiom 5.1. Hide Caption
2. This line intersects the segment CB at the midpoint.	2 2	2. Theorem 34.
3. Line DE coinsides with the line from the statement 1.	3 3	3. Axiom 1.2 (Only one line through two points)

Proof of b).

1. Draw a line through point E|| AC.	1 1	1. Axiom 5.1
Denote the point of intersection as F. 2. |AF|=|FB|.	2 2	2. Theorem 34.
3. |DE|=|AF|.	3 3	3. ADEF is a parallelogram.