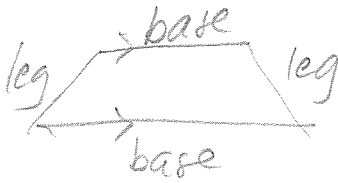


Definitions:

- 1) Trapezoid – a quadrilateral w/ exactly 1 pair of parallel sides;



green text - defines as at least 1 pair of parallel sides.

- 2) Isosceles trapezoid – a trapezoid with \cong legs

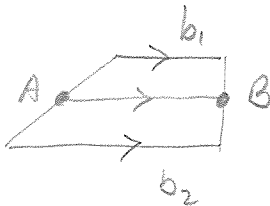


- 3) Midsegment of a trapezoid – a segment that connects the midpoints of the legs.



Theorem: The midsegment of a trapezoid...

- (1) is parallel to the base;
- (2) has a length equal to the average of the measures of the bases.



$$AB = \frac{1}{2}(b_1 + b_2)$$

Three theorems about the isosceles trapezoid:

1. If a trapezoid has one pair of congruent base angles, then it is an isosceles trapezoid.
2. A trapezoid is isosceles if and only if its diagonals are congruent.
(Notice that this is a biconditional statement. What is the significance of that?)

- must have a trapezoid or prove one
- show $diag. \cong \rightarrow$ isos. trap.
- show isos trap \rightarrow $diag. \cong$.

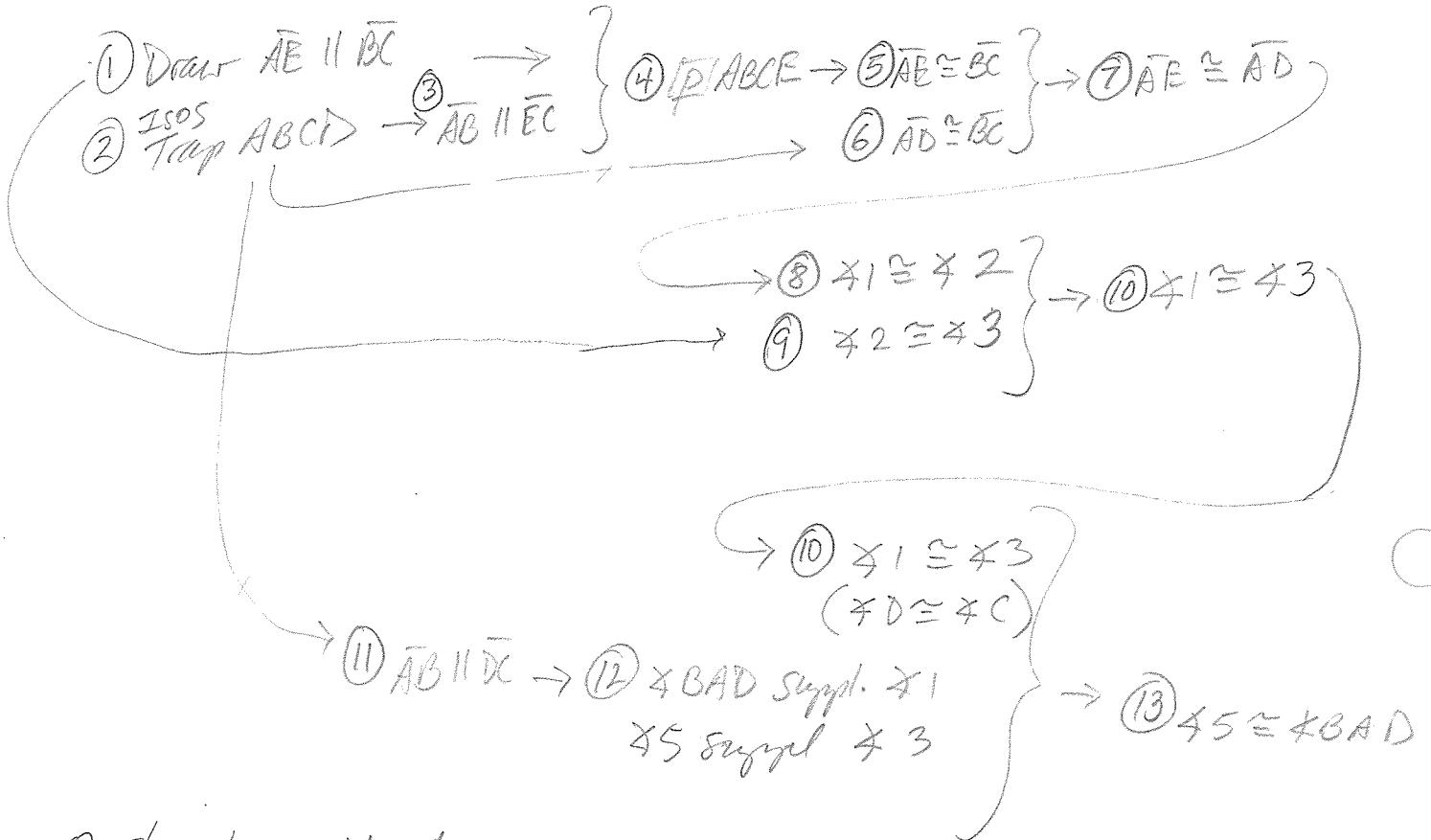
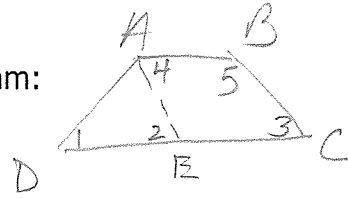
3. The base angles of an isosceles trapezoid are congruent.
 (If isos. trap, then base angles congruent.)

Proof of theorem:

Given: $ABCD$ isos. trap

Prove: $\angle A \cong \angle B$, $\angle D \cong \angle C$

Diagram:



① Through a point not on a line, there is exactly 1 line parallel to given line.

② Given

③ Trap \rightarrow 1 pair \parallel lines

④ 2 pairs sides $\parallel \rightarrow \square$

⑤ $\square \rightarrow$ opp sides \cong

⑥ Isosceles trap \rightarrow legs \cong

⑦ Transitive Property

⑧ If 2 sides of $\Delta \cong$, \angle s opp \cong

⑨ 2 \parallel lines \rightarrow corresp. \angle s \cong

⑩ Transitive prop.

⑪ Isos trap \rightarrow 1 pair \parallel sides.

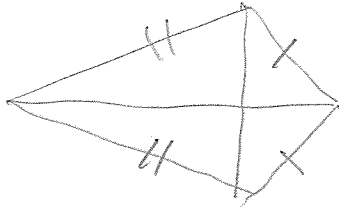
⑫ 2 \parallel lines \rightarrow same side interior \angle s supplementary

⑬ Congruent supplements then

Kites

Definition: A kite is a quadrilateral with two distinct pairs of congruent consecutive sides.

diagram:



Four kite theorems:

1. If a quadrilateral is a kite, then its diagonals are perpendicular.
2. If a quadrilateral is a kite, then exactly one pair of opposite angles are congruent.
3. If a quadrilateral is a kite, then one of the diagonals bisects the pair of non-congruent angles.
4. If a quadrilateral is a kite, then exactly one diagonal bisects the other.

