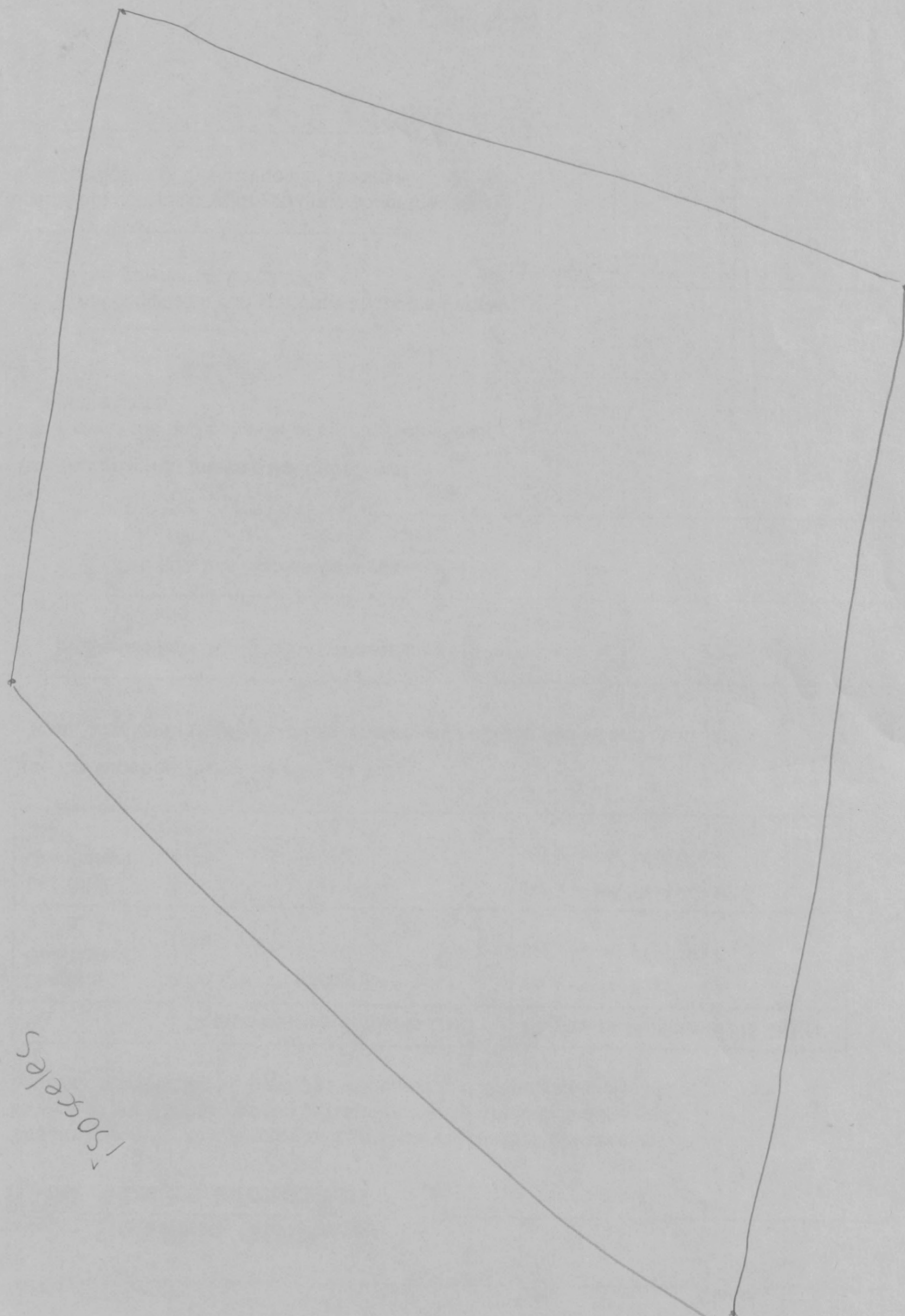
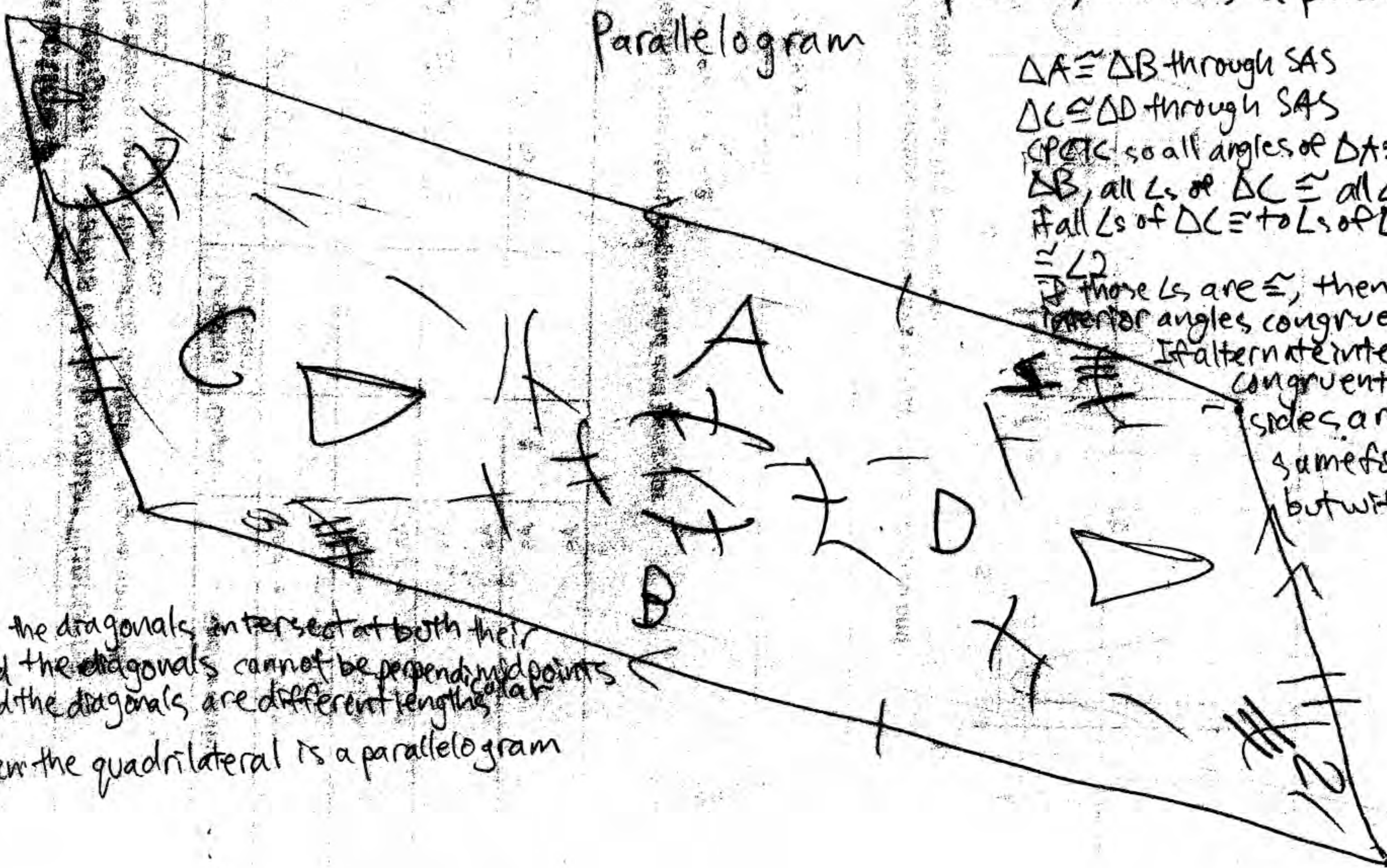

isosceles

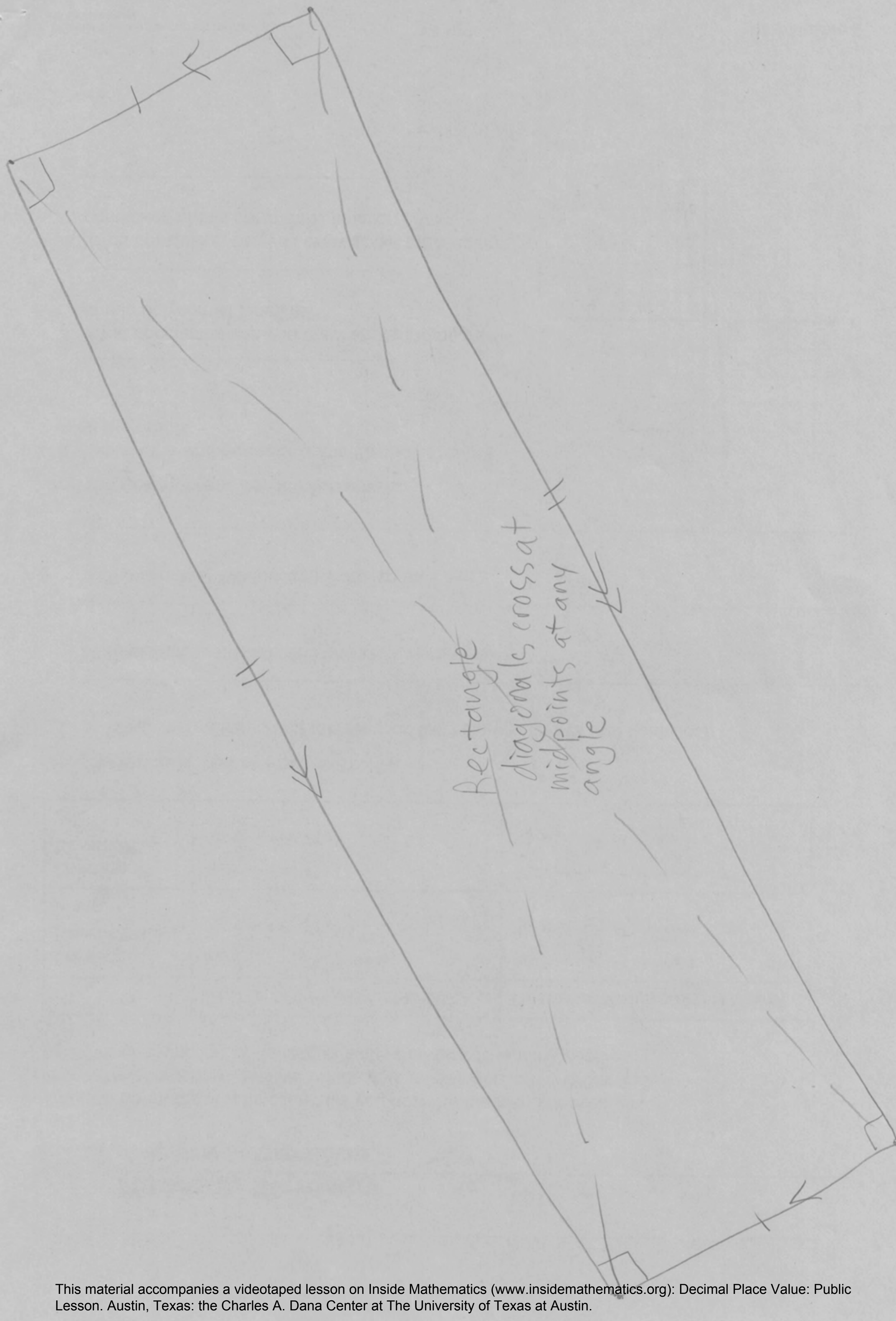
If you connect the ~~blue~~ short & ~~yellow~~ long sticks at their midpoints, & any angle you put them ~~in any~~, except for parallel, the it is a parallelogram.

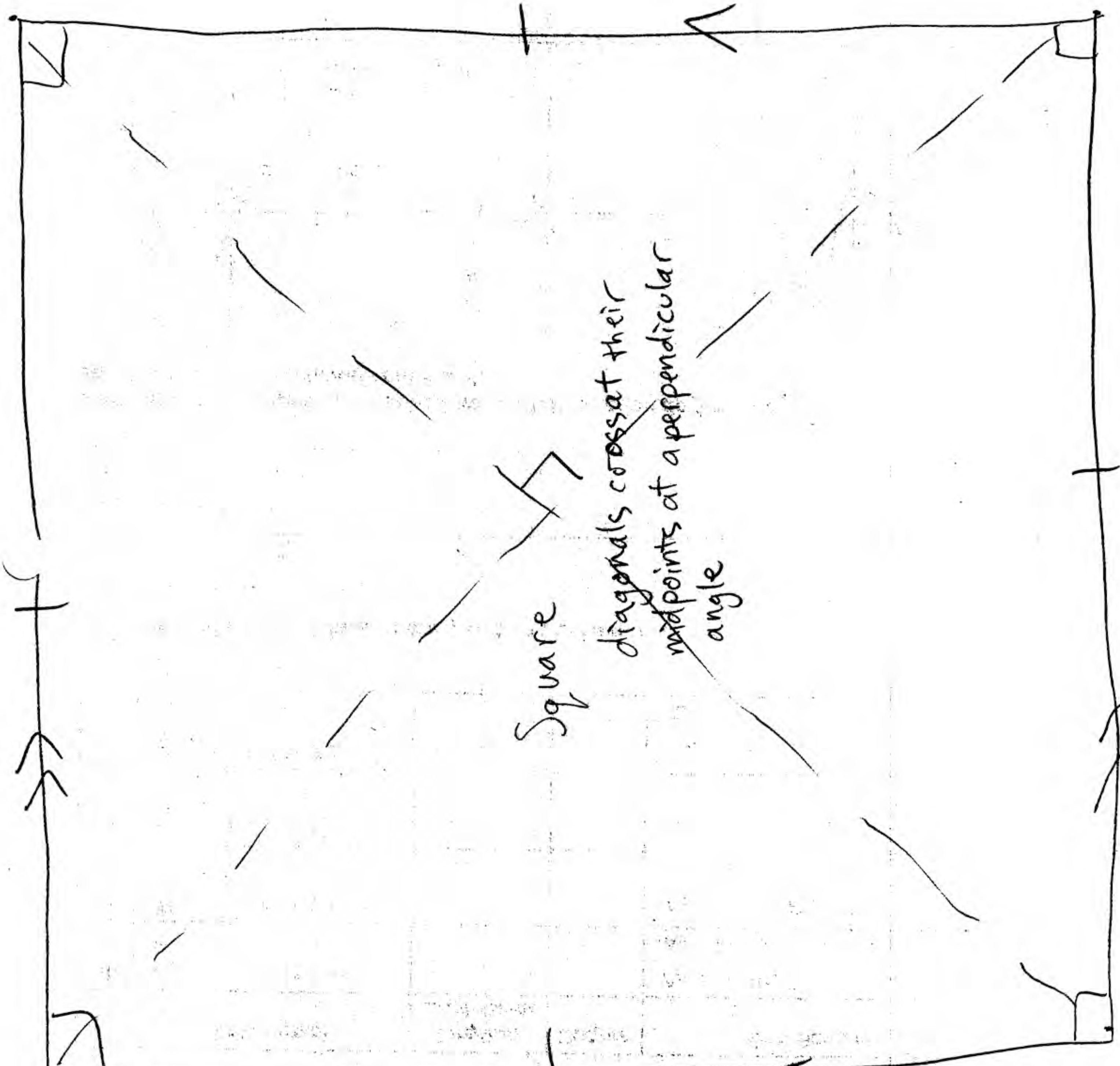
Parallelogram

$\Delta A \cong \Delta B$ through SAS
$\Delta C \cong \Delta D$ through SAS
CPCTC so all angles of $\Delta A \cong$ to angles of ΔB, all $\angle$s of $\Delta C \cong$ all $\angle$s of ΔD
If all $\angle$s of $\Delta C \cong$ to $\angle$s of ΔD, then $\angle 1 \cong \angle 2$
If those $\angle$s are $\cong$, then they alternate interior angles congruent
If alternate interior angles congruent, then two sides are parallel
same for Δs A & B but with $\angle$s 3 & 4

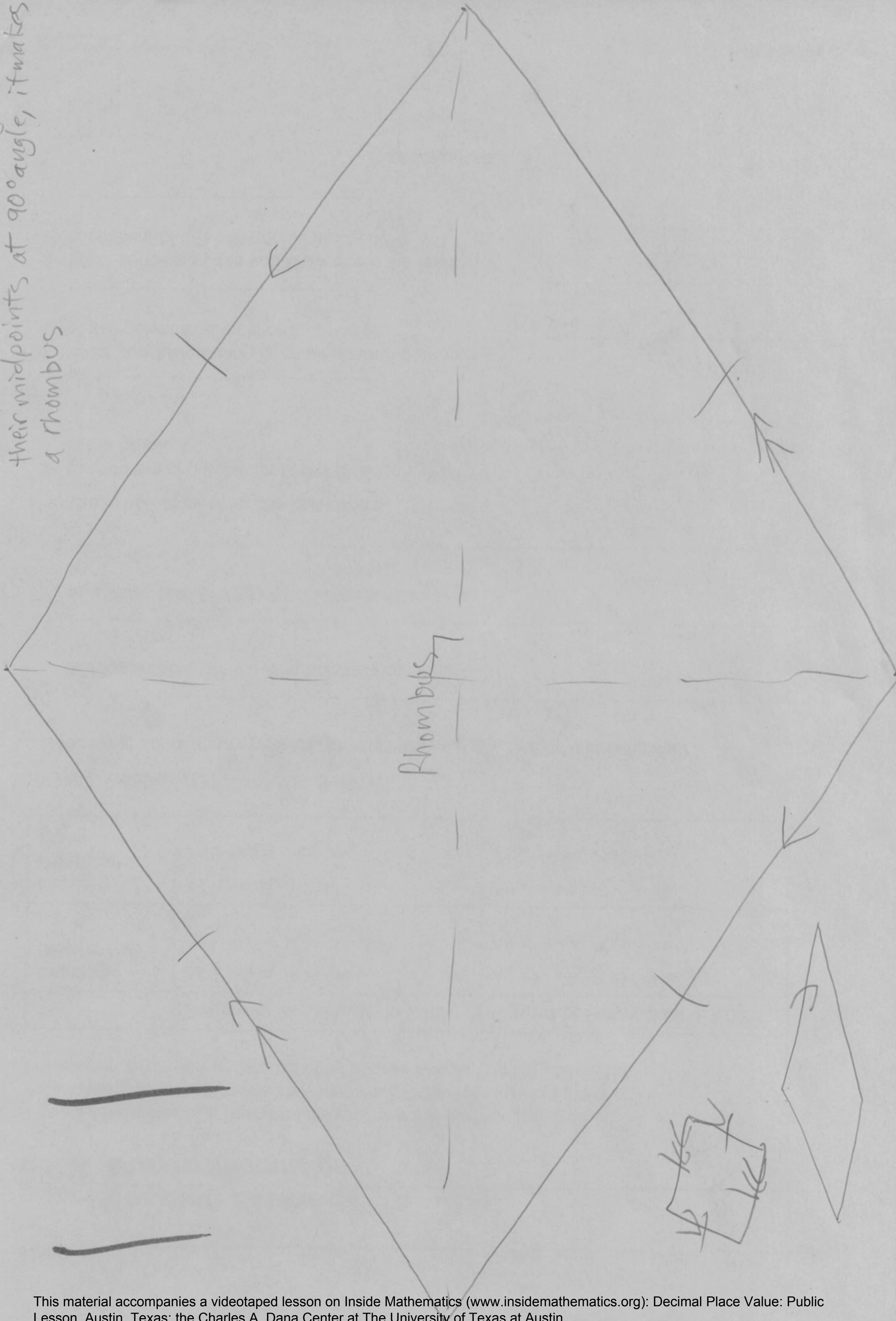


If the diagonals intersect at both their midpoints
and the diagonals cannot be perpendicular
and the diagonals are different lengths
then the quadrilateral is a parallelogram

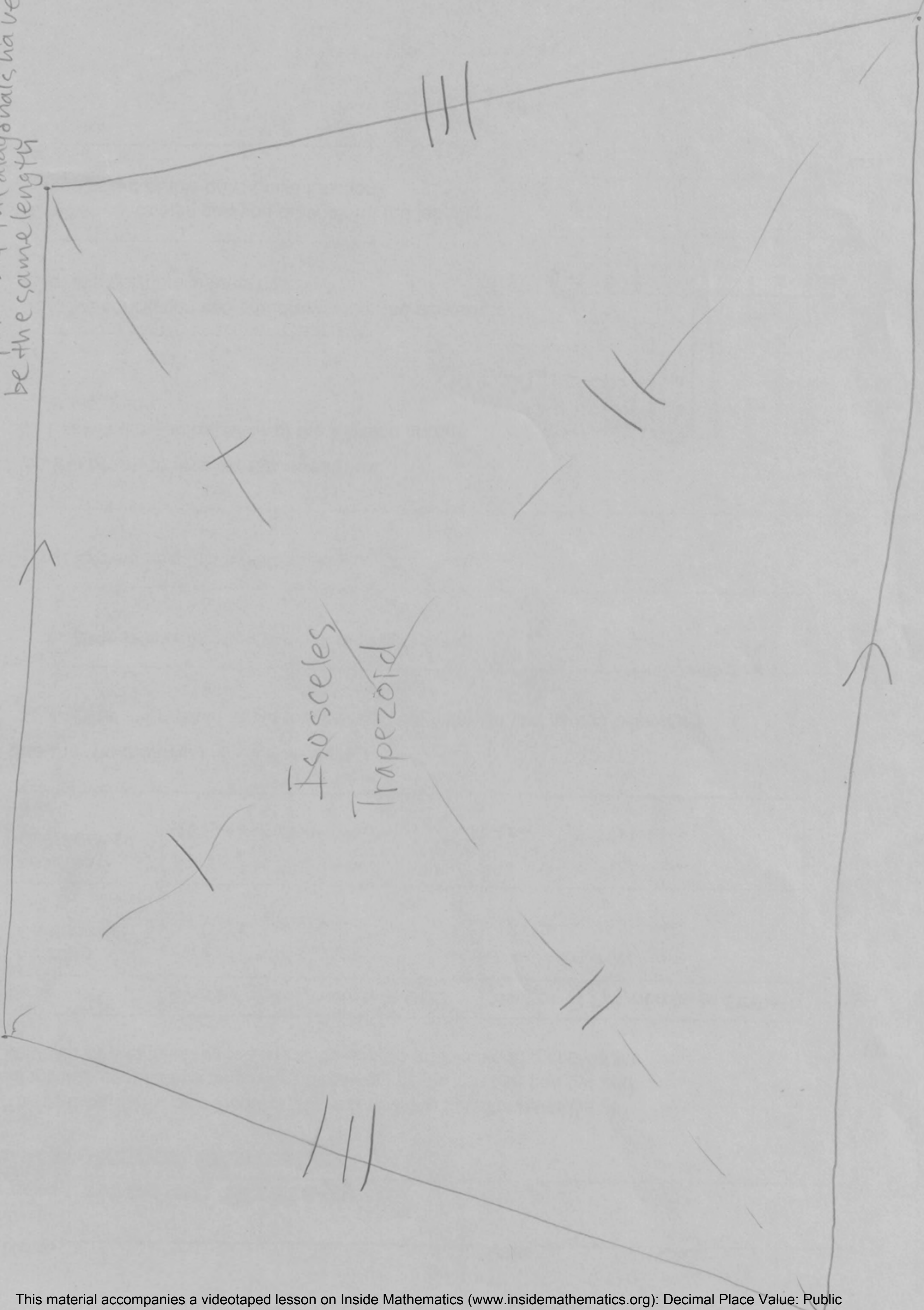

Rectangle
diagonals cross at
midpoints at any
angle


Square
diagonals crossat their
midpoints at a perpendicular
angle

If you connect two diagonals at their midpoints at 90° angle, it makes a rhombus

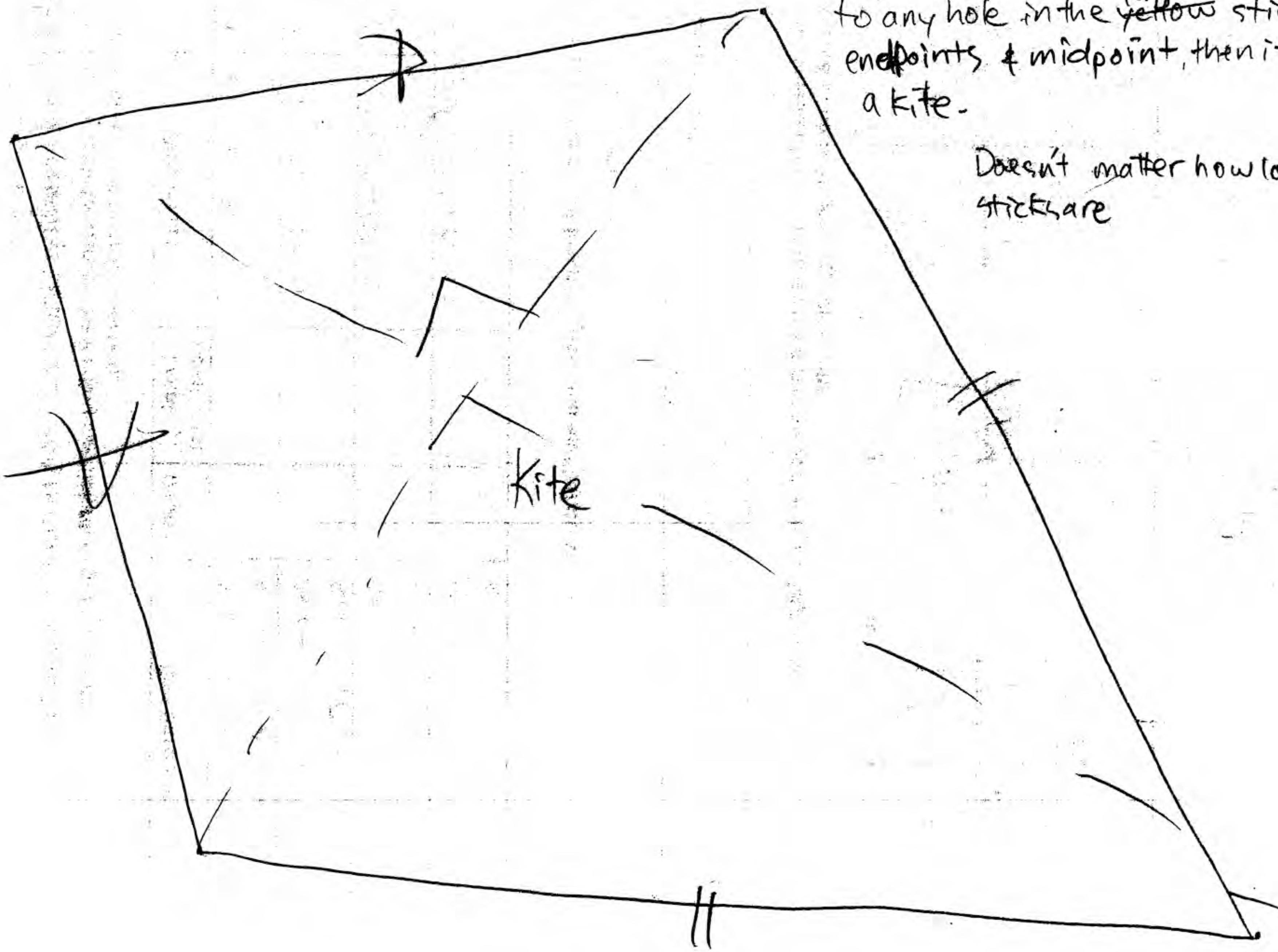


The two diagonals have to cross at the same distance from the endpoints & the diagonals have to be the same length



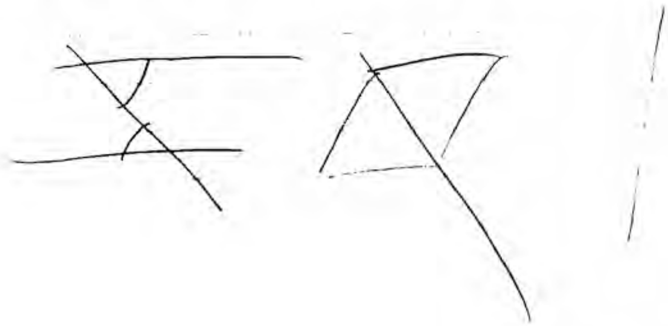
If you put ~~blue~~ midpoint of short stick perpendicular to any hole in the ~~yellow~~ long stick except endpoints & midpoint, then it will make a kite.

Doesn't matter how long sticks are



Block 1 3/3/09

How can we construct a non-isosceles trapezoid?

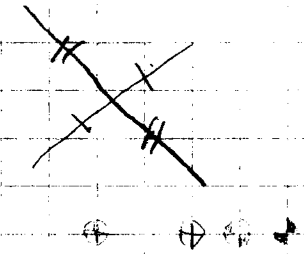


I drew alot of shapes, & defined how I arranged the sticks. However, I did not have too many observations along the way. I'll make more observations next time so that maybe, one of them might help me realize something I did wrong or lead me to the solution.

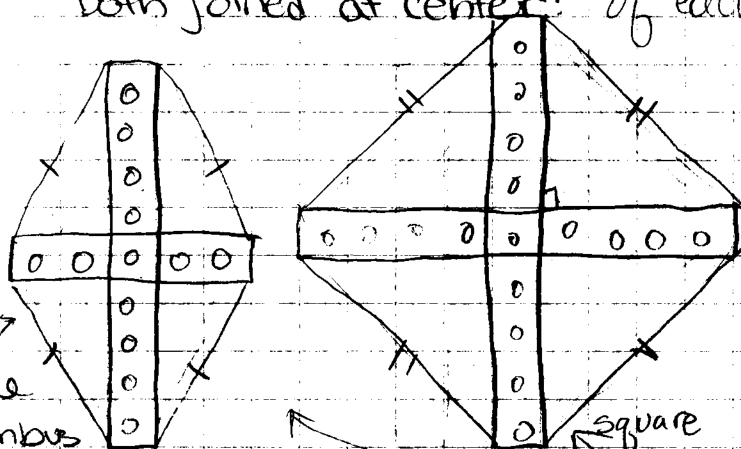
Block 1 3/8/09

Kites; trapezoid, trapezium, rhombus, ||ogram, square, rectangle

1 long, 1 short



both joined at center: of each "I"



and angle rhombus

square

90° angles

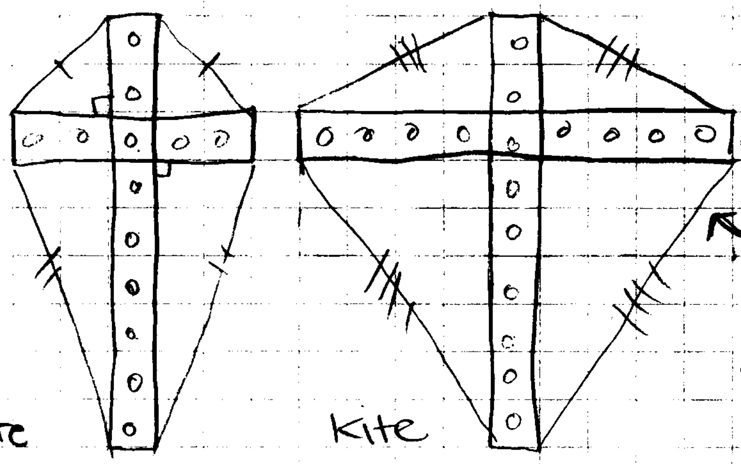
parallelogram: two joined at center, no limit on angles

rhombus: 90° angles in center

square: 90° angle in center, same length diagonals

parallelograms

one joined at center:

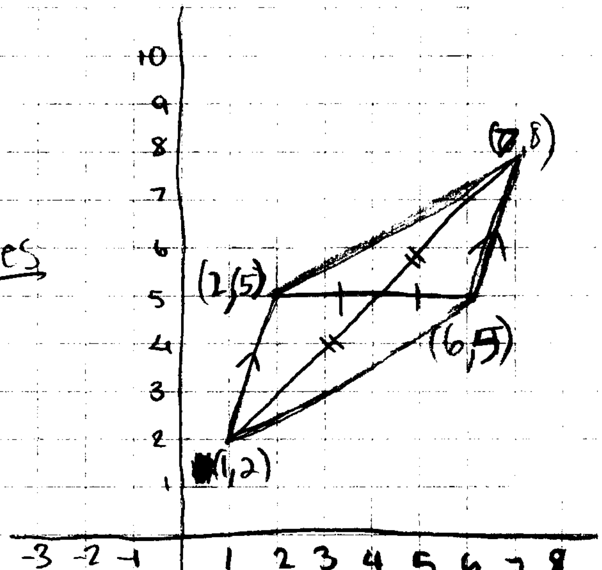


90° angles

Kite

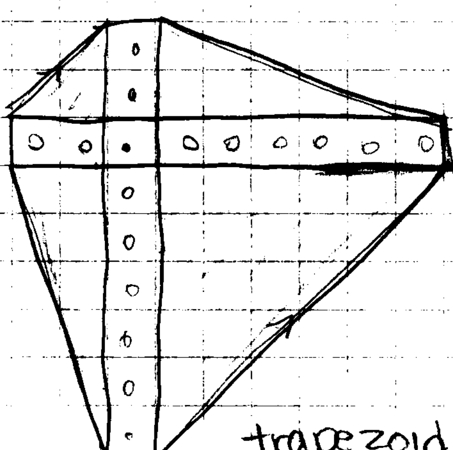
Kite

$\frac{y_1 - y_2}{x_1 - x_2}$



same lengths joined same dist. away:

as long as both sides are joined the same distance from their ends.



trapezoid

$\frac{5-2}{2-1} = \frac{3}{1}$

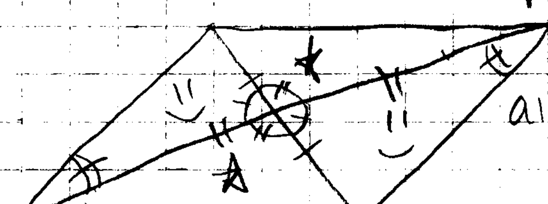
$\frac{8-5}{7-6} = \frac{3}{1}$

same slope: parallel

$\frac{5-2}{6-1} = \frac{3}{5}$

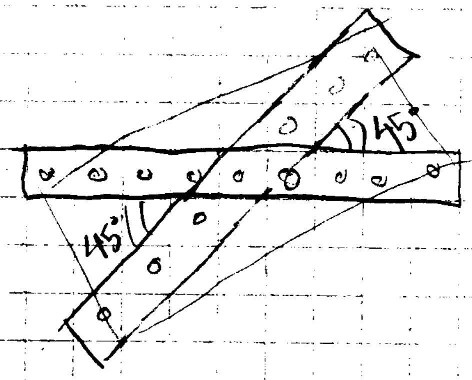
$\frac{8-5}{7-2} = \frac{3}{5}$

same slope: parallel



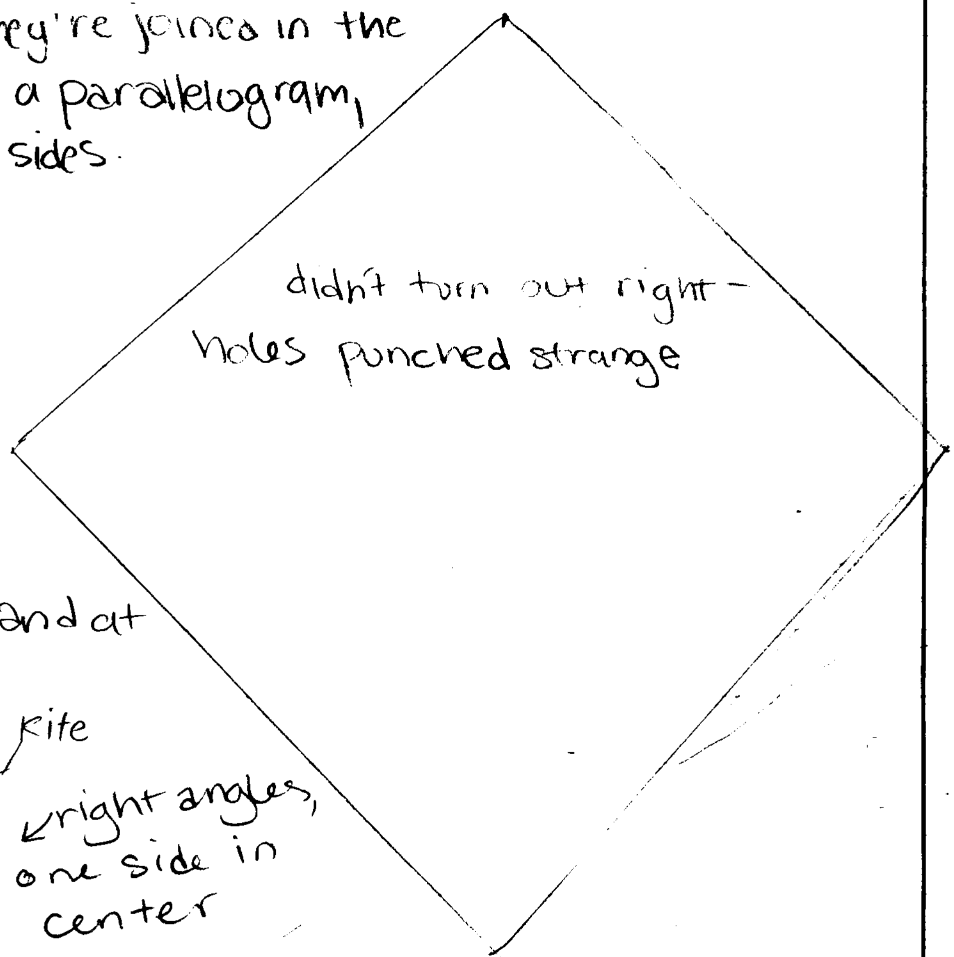
alt. int. ∠

rectangle:

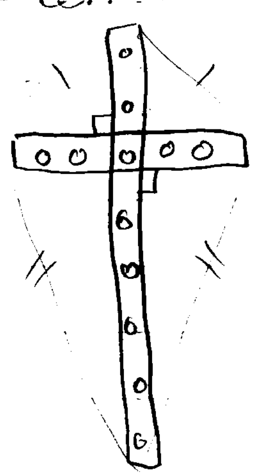


|| o gram if dias r same length
same length /'s = same length
side
at rt ∠'s = square

as long as they're joined in the
center, it'll be a parallelogram,
and thus hav ≅ sides.

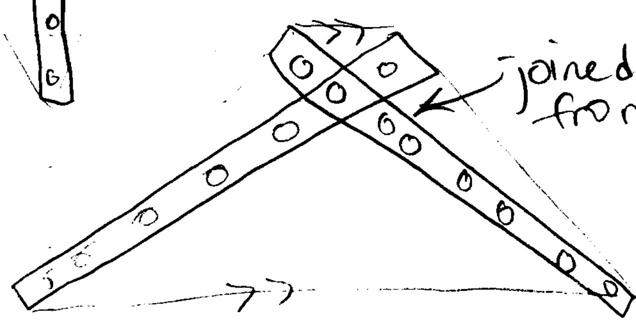


At right ∠'s, and at
the center

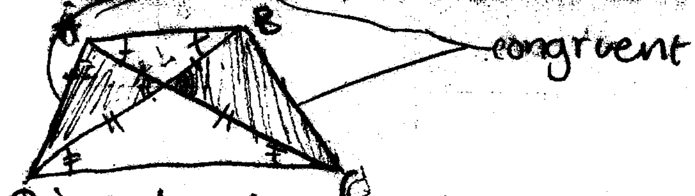


kite

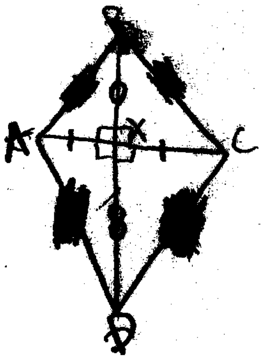
right angles,
one side in
center



joined same distance
from each side



isosceles Δ



kite: has one ~~segment~~ diagonal bisected by the other longer side
90∠'s

given: $\overline{AX} \cong \overline{CX}$

$\angle AXB \cong \angle CXB$ (both 90°: same m, ≅)

$BX \cong BX$: reflexive prop

$\Delta ABX \cong \Delta CBX$: SAS

CPCTC : $\overline{AB} \cong \overline{CB}$

$\overline{AX} \cong \overline{CX}$ (given)

$\angle AXD \cong \angle CXD$ (both 90°: same m, ≅)

$\overline{XD} \cong XD$: reflexive prop

$\Delta AXD \cong \Delta CXD$: SAS

CPCTC: $\overline{AD} \cong \overline{CD}$

◊ABCD is a kite: 2 consecutive pairs of congruent sides

LF1

Block 1

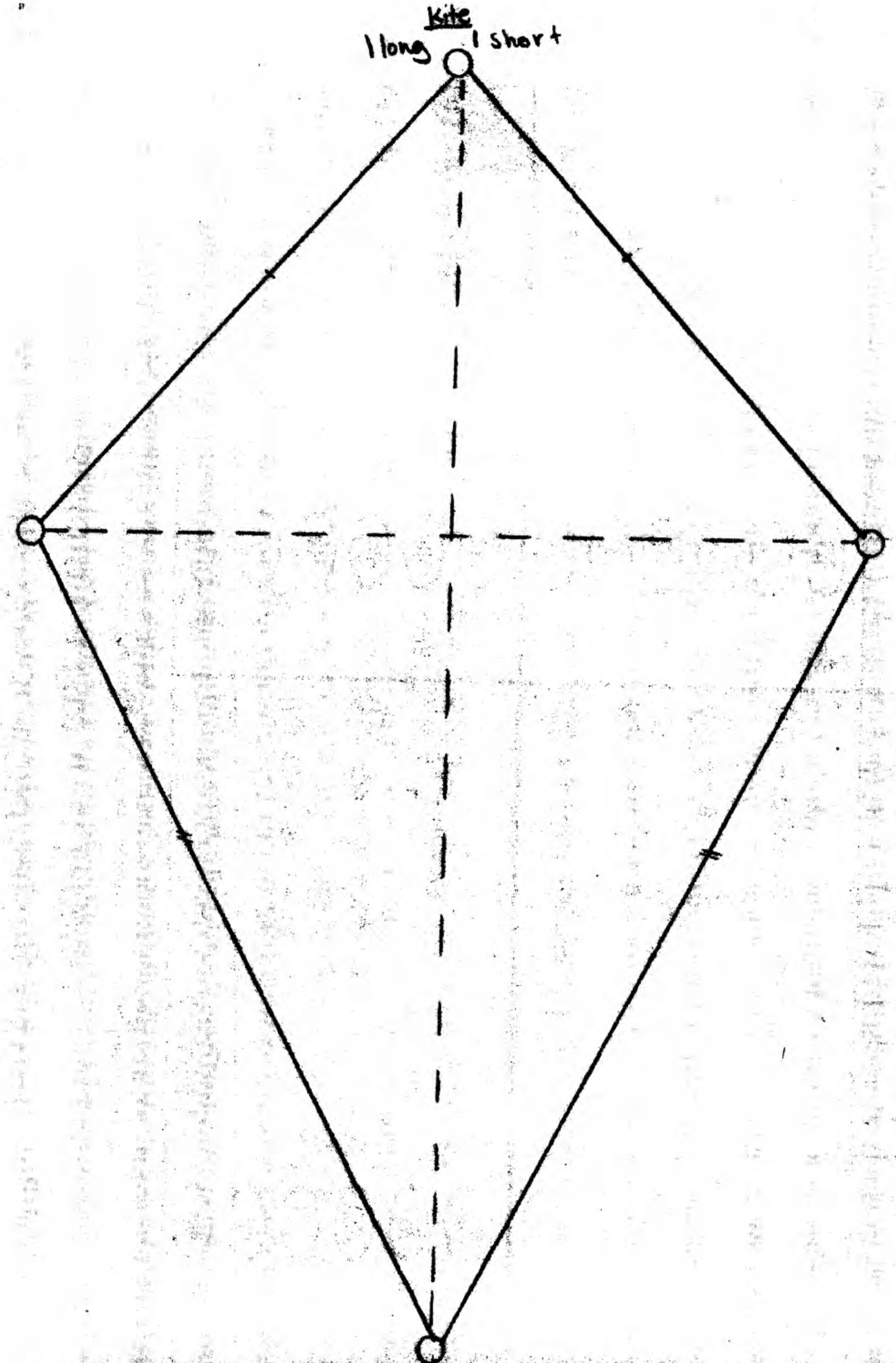
How am I going to prove that lines are parallel?

Is there another way to make a trapezoid?

Why doesn't the kite maker just mass-produce?!?

I think I did well diagrams, explanations, figuring it out

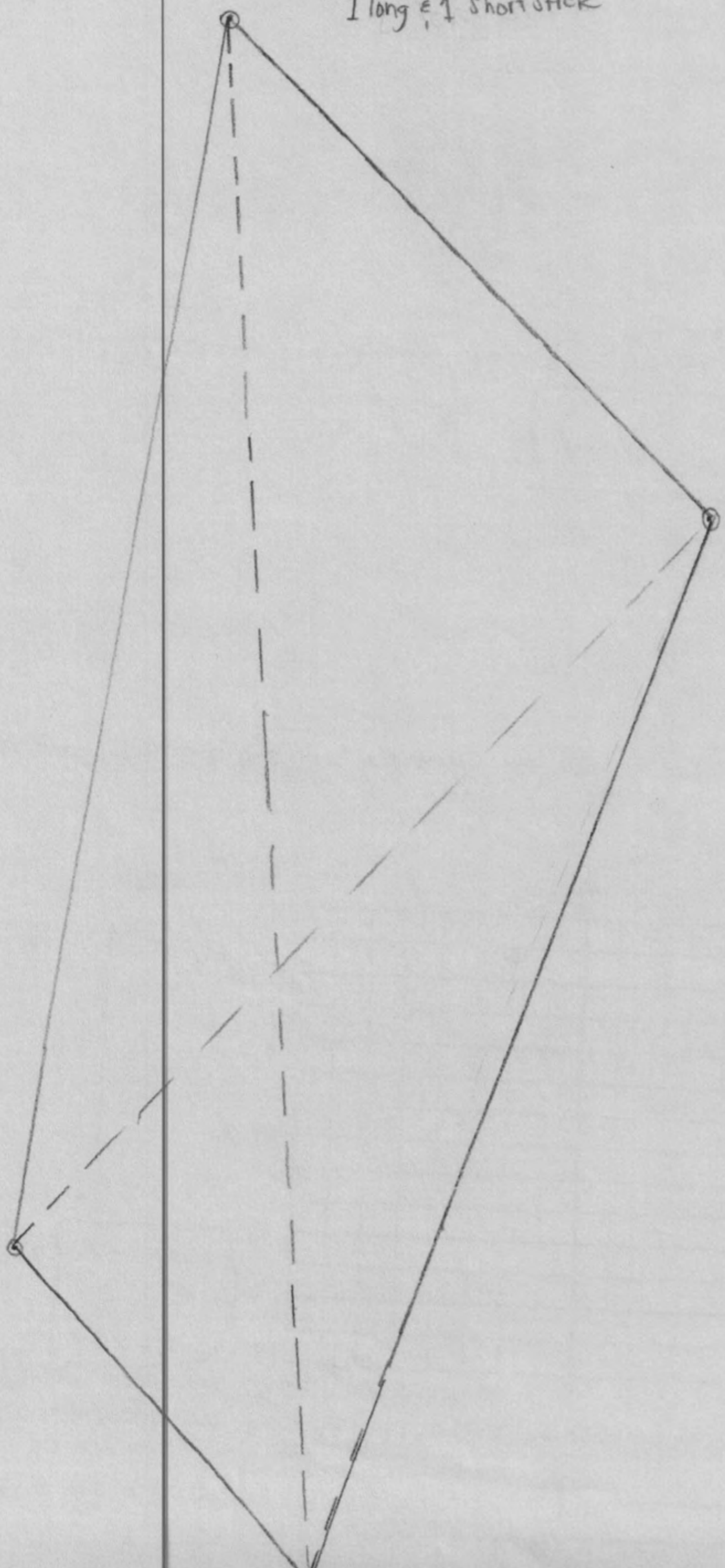
I could improve documenting all my process, from my 1st thot. Keeping track of all my discoveries, relevant or not. drawing more pix, doing more thinking on paper. be more thorough & organized


Kite
1 long
1 short

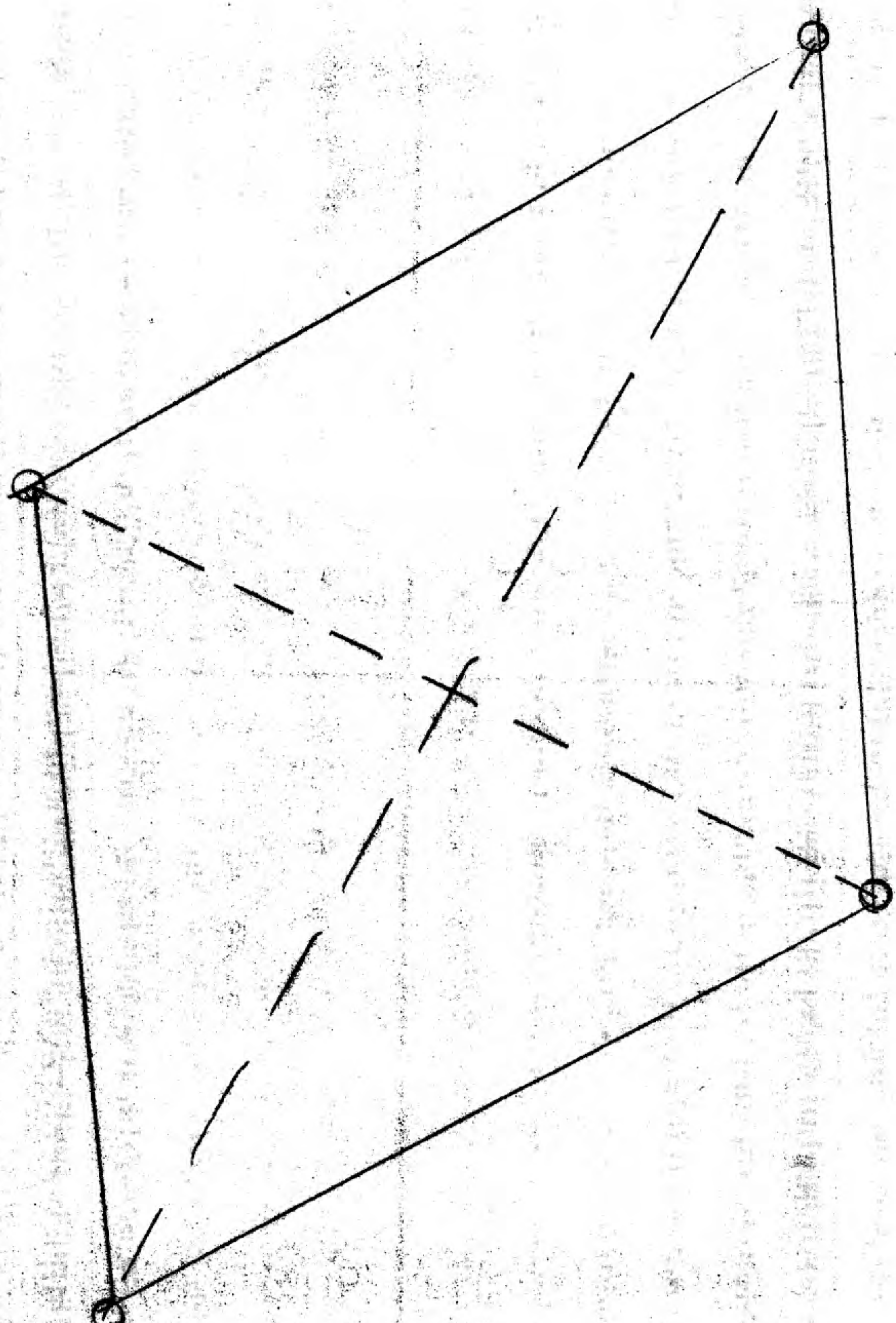
BRK.1 3/3/04

Trapezium

1 long & 1 short stick



Blk.1 3/5/09



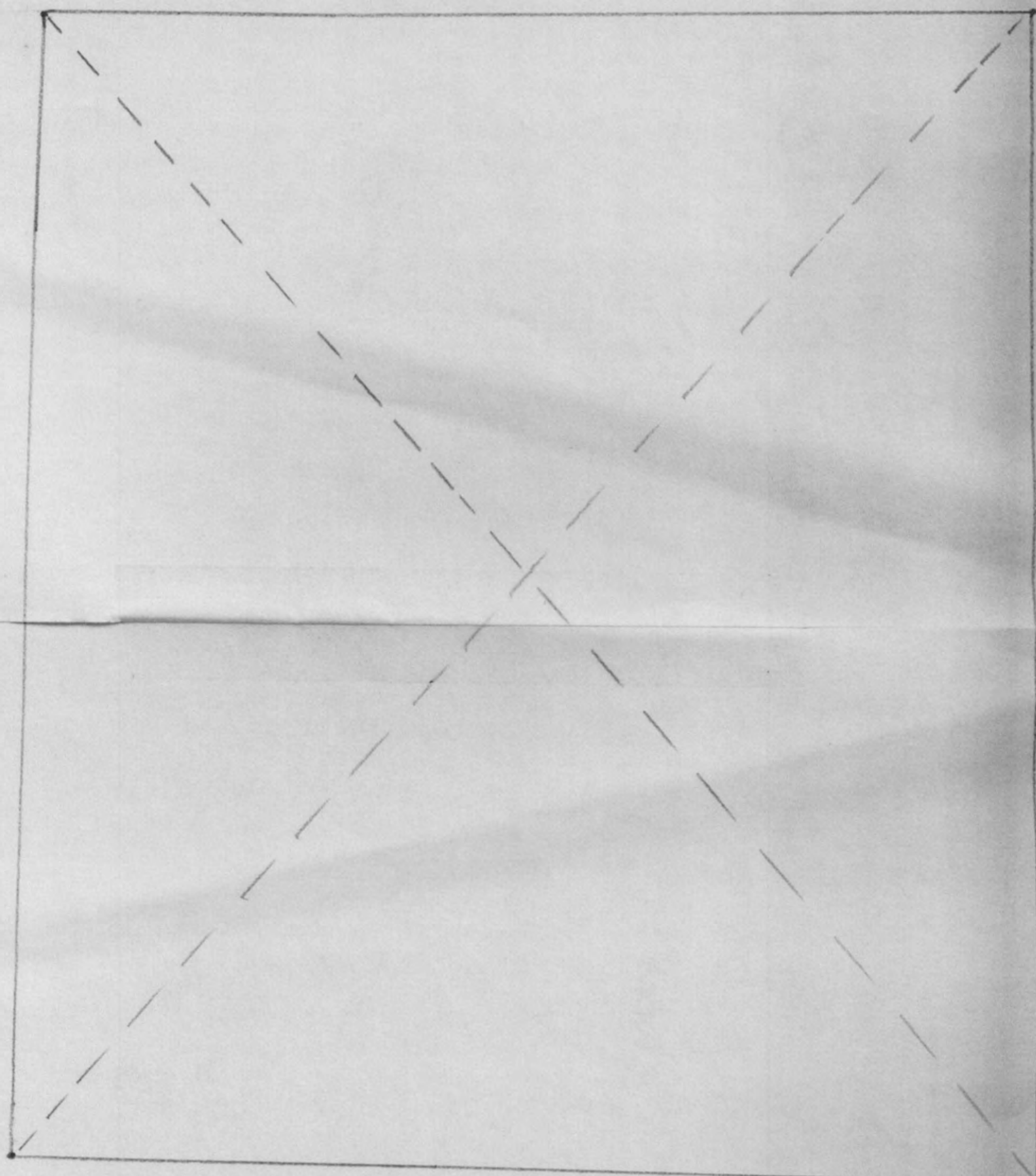
rectangle

When you make a cross with 90° using a long a short stick you cannot create a rectangle. The short stick has to be aligned withe the long stick through the center hole and at a 90° angle. But the short sticks length prevents a rectangle from beineg mad and instead a parellelogram.

3

Rectangle Square ? Rhombus ? Rhombus

2 long sticks



Why can't you make a trapezoid with 1 long stick & 1 short stick?

BLK.1 3/3/09

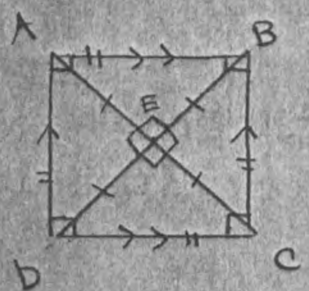
Something I thought I did well on was constructing the different types of quad. to see which shapes worked & which ones didn't. Something I think I could improve by giving more info. on the page with the figures.

BK1

Square

If the diagonals bisect eachother
and the diagonals are congruent
and the diagonals are perpendicular

Then the quadrilateral is a square.

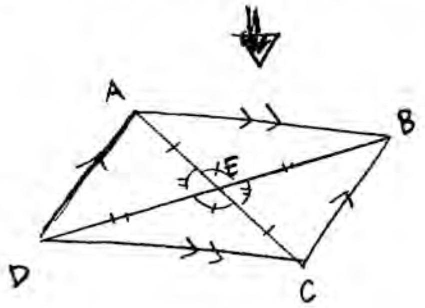


statement	reason
1) $\angle DEC \cong \angle BEA$	1) given
2) $\angle AED \cong \angle CEB$	2) given
3) $\overline{DB} \perp \cong \overline{CA}$	3) given
4) $\overline{AC} \cong \overline{DB}$	4) given
5) $\angle EAB \cong \angle ECD$	5) CPCTC
6) $\overline{AB} \parallel \overline{DC}$	6) alternate interiors
7) $\Delta AED \cong \Delta CEB$	7) SAS
8) $\angle ADE \cong \angle CBD$	8) CPCTC
9) $\overline{AD} \parallel \overline{BC}$	9) alternate interiors
10) $\overline{AB} \cong \overline{BC} \cong \overline{CD} \cong \overline{DA}$	10) CPCTC
11) $m\angle ADC, m\angle DAB, m\angle BCD, m\angle ABC = 90°$	11) all 4 are isosceles triangles.
12) ABCD is a square	12) 6, 9, 10, 11

(!!)

Parallelogram : a quad. w/ 2 pairs of parallel sides

- diagonals bisect each other
- diagnals arent perpendicullar
- diagonals are different lengths



statement	Reason
1) bisect each other	1) given
2) 2 pairs of parallel sides	2) diagonals bisect each other
3) diagonals are different lengths	3) not a square / rectangle
4) diagonals are not $\perp$	4) not a kite / rhombus.

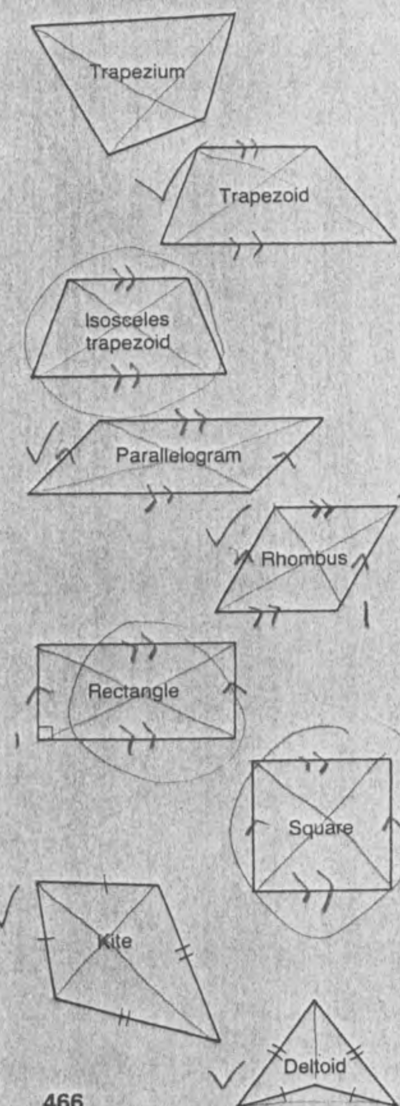
1 $\angle CED \cong AED$	1 given
2 $\angle AED \cong \angle BEC$	2 given
3 $\overline{AE} \cong \overline{EC}$	3 given
4 $\overline{DE} \cong \overline{EB}$	4 given

statement	Reason
1) $\Delta CED \cong \Delta AEB$	1) SAS
2) $\angle DCE \cong \angle BAE$	2) CPCTC
3) $\overline{AB} \parallel \overline{DC}$	3) Alternate interior
4) $\Delta BEC \cong \Delta DEA$	4) SAS
5) $\angle EAD \cong \angle BCE$	5) CPCTC
6) $\overline{AD} \parallel \overline{BC}$	6) Alternate Interiors

This material accompanies a videotaped lesson on Inside Mathematics (www.insidemathematics.org): Decimal Place Value: Public Lesson. Austin, Texas: the Charles A. Dana Center at The University of Texas at Austin.

Blk1
3/3/09

QUADRILATERALS



QUADRILATERAL: a POLYGON with exactly four sides.

VARIOUS TYPES OF QUADRILATERALS

Trapezium: a quadrilateral in which no pair of sides is parallel. (*Trapezium* in British usage means trapezoid.)

Trapezoid: a quadrilateral in which one and only one pair of sides is parallel.

Isosceles Trapezoid: a trapezoid in which the nonparallel sides are equal in length.

Parallelogram: a quadrilateral in which both pairs of opposite sides are parallel. ~~The opposite sides of a parallelogram are equal, and the opposite angles are equal.~~

Rhombus: a parallelogram in which two adjacent sides are equal. Since a rhombus is a parallelogram, opposite sides are equal. Therefore, all four sides of a rhombus are equal.

Rectangle: a parallelogram in which one angle equals 90°. Since a rectangle is a parallelogram, opposite angles are equal, and adjacent angles are supplementary (total 180°). Therefore, every angle of a rectangle equals 90°.

Square: a rectangle in which two adjacent sides are equal. Since a square is a rectangle, which is a parallelogram, opposite sides are equal. Therefore, all four sides of a square are equal.

Kite-shaped Quadrilateral: a convex quadrilateral in which two pairs of adjacent sides are equal, but opposite sides are not parallel. (In a *convex* POLYGON, every interior angle is less than 180°.)

Deltoid: a concave quadrilateral in which two pairs of adjacent sides are equal, but opposite sides are not parallel. (In a *concave* polygon, at least one interior angle is greater than 180°.)