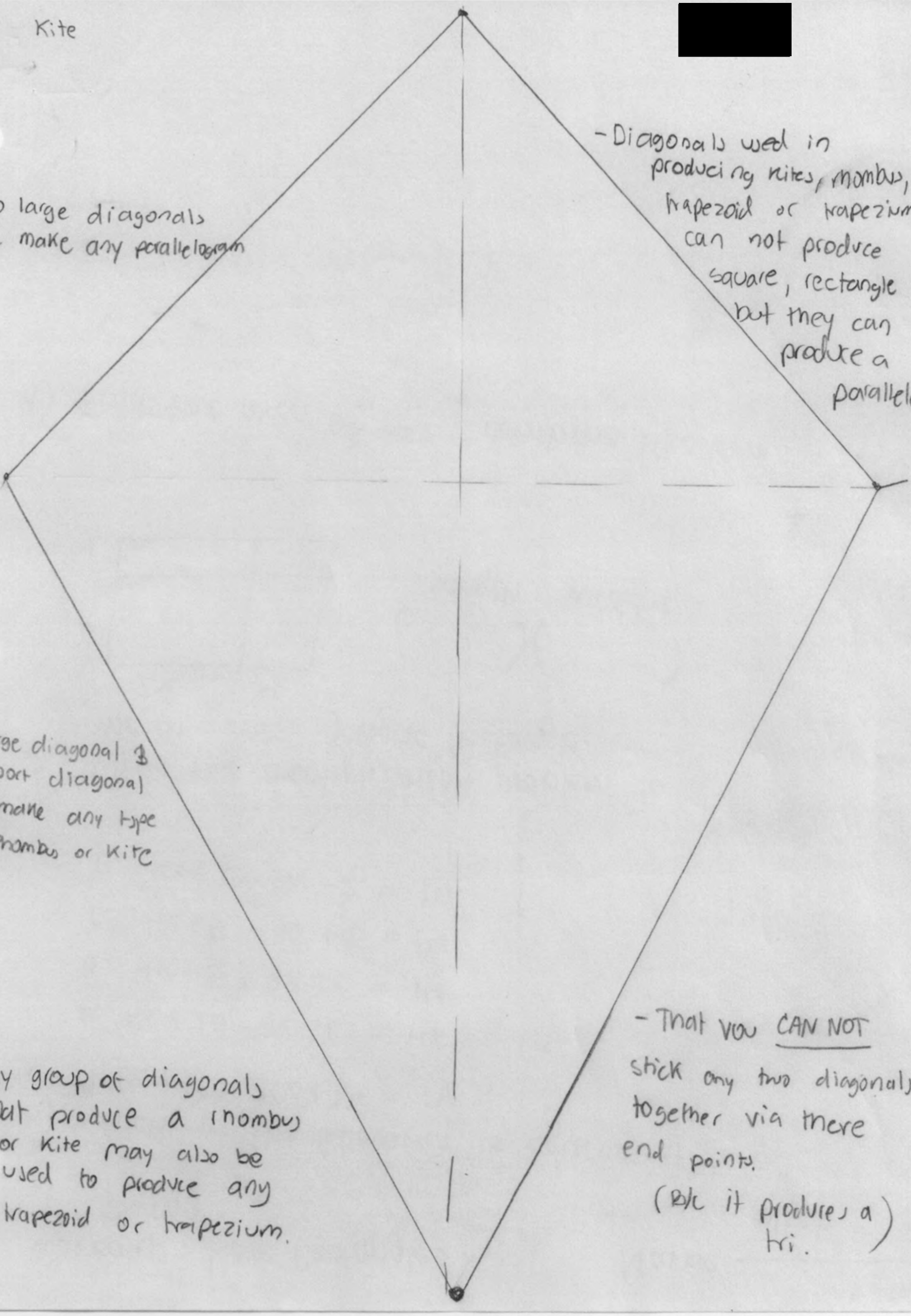
① Kite

[redacted]



- Two large diagonals can make any parallelogram

- Diagonals used in producing kites, rhombus, trapezoid or trapezium can not produce square, rectangle but they can produce a parallelogram

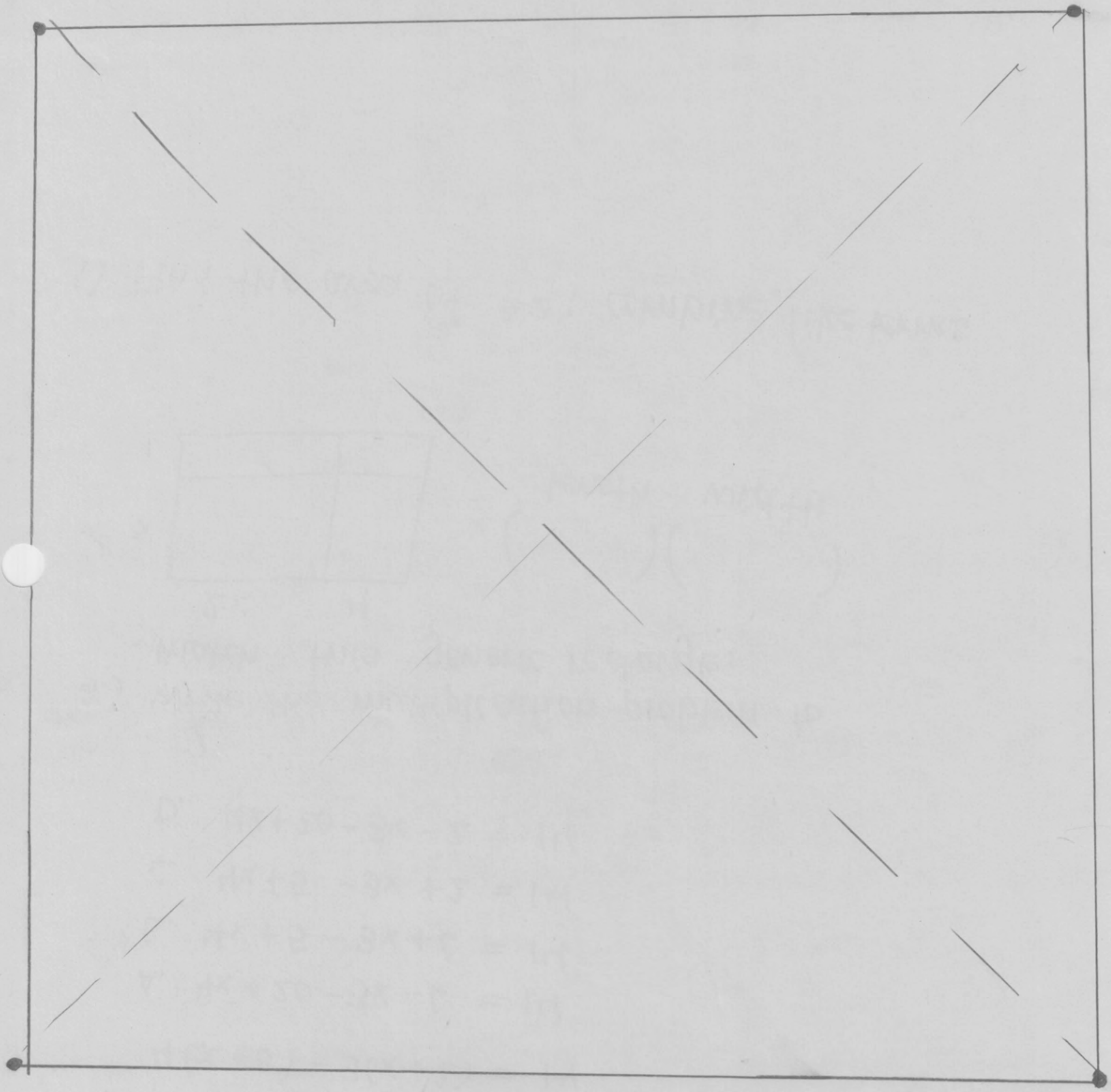
- A large diagonal & a short diagonal can make any type of rhombus or kite

- Any group of diagonals that produce a rhombus or kite may also be used to produce any trapezoid or trapezium.

- That you <u>CAN NOT</u> stick any two diagonals together via there end points. (B/c it produces a tri.)

[redacted]

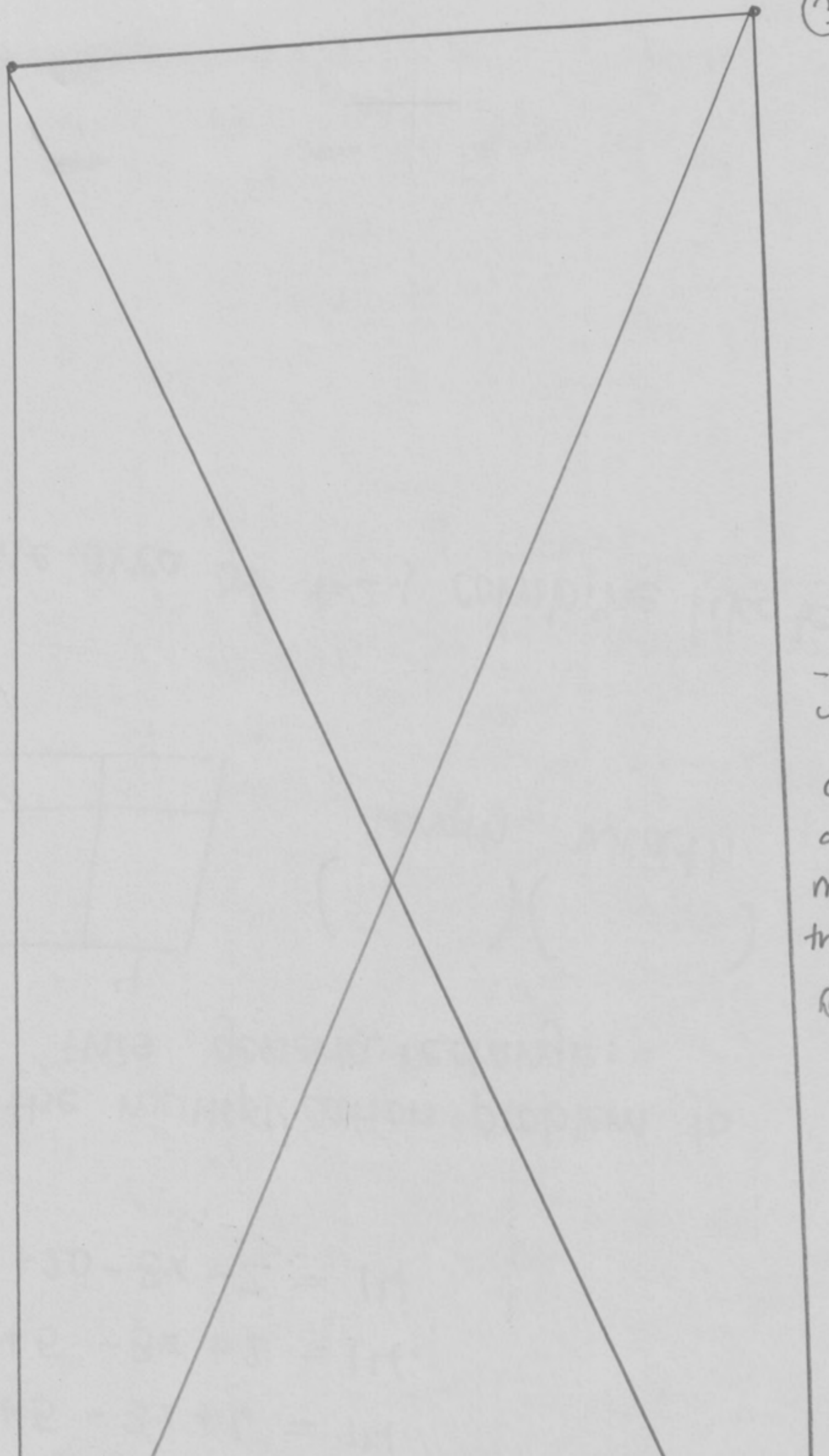
② square



- With 2 large diagonals you can make any rectangle, square or parralelogram

[redacted]

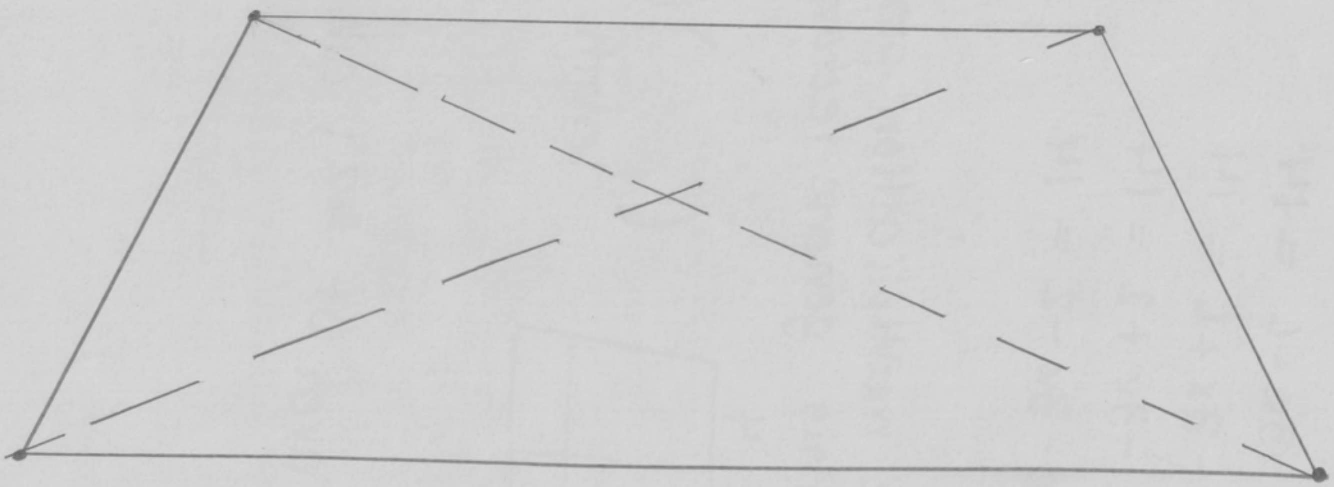
(3) Rectangle



-Produced by using 2 large diagonals crossed at each others midpoints but the mp do not form 90° ∠.

4.) Trapezoid

-Everything (Every combination) of diagonals that can produce a trapezoid can also produce a trapezium.



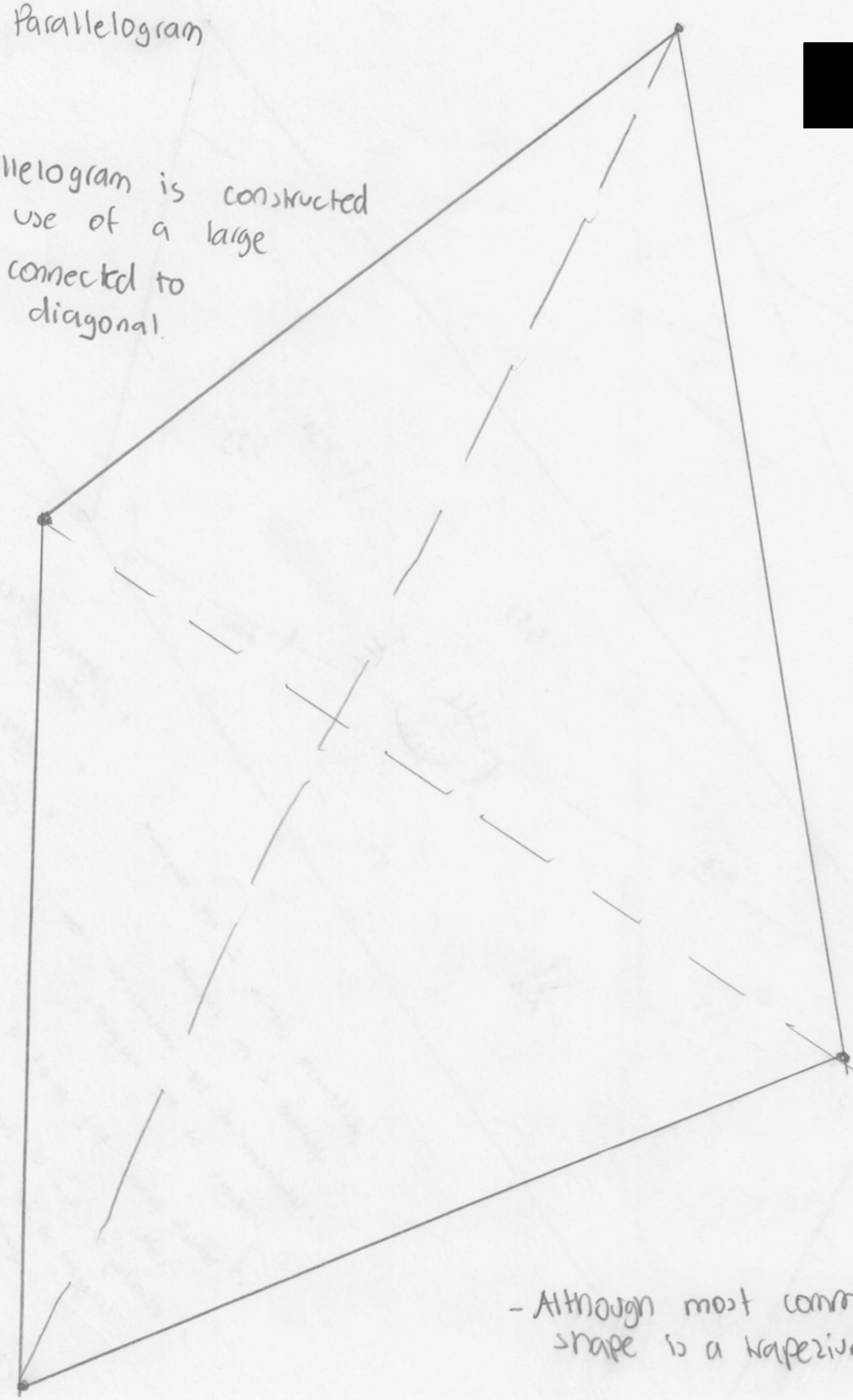
[redacted]

5.) Parralelogram

(Supposed)
Parallelogram

[redacted]

- A parallelogram is constructed with the use of a large diagonal connected to a short diagonal

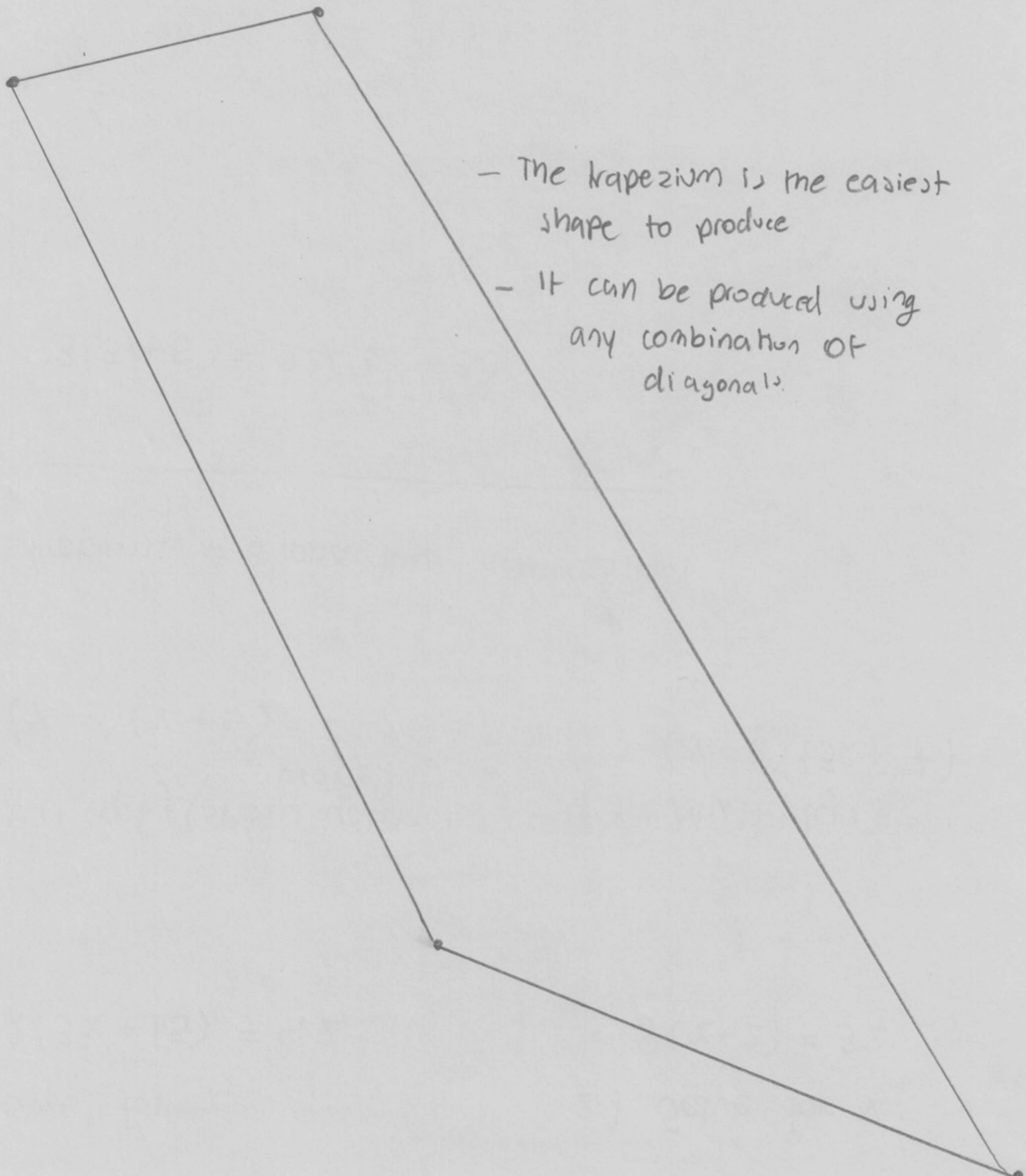


- Although most common shape is a trapezium

BACK

[redacted]

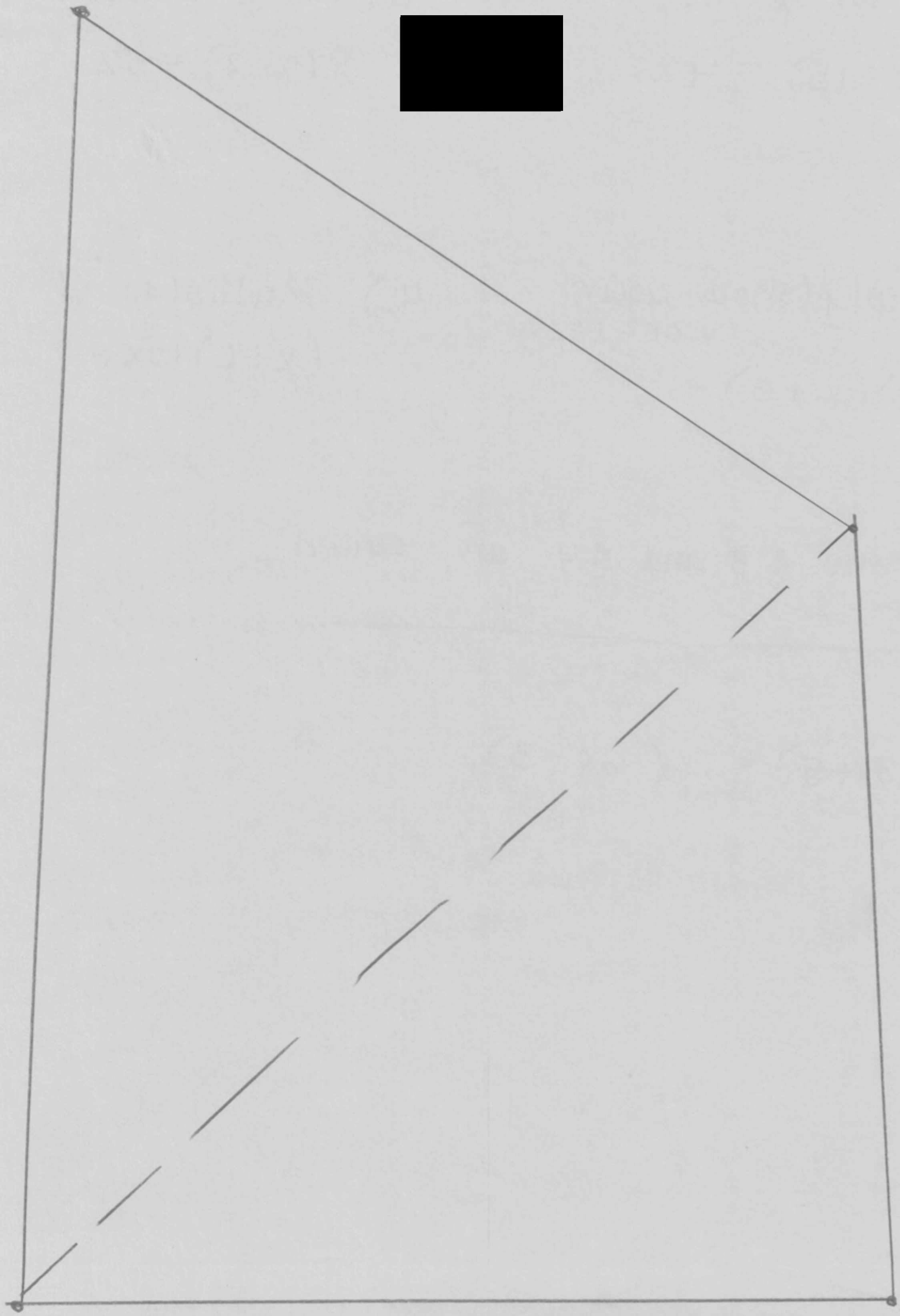
6) trapezium



- The trapezium is the easiest shape to produce
- It can be produced using any combination of diagonals.

7.) Different Trapezoid

[redacted]



[redacted]

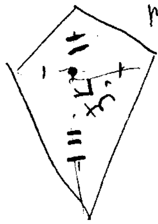
why is it that a rhombus can produce a trapezoid, trapezium, kite, & a parralelogram but why cant a kite? What other types of shapes can we produce that we might have missed?

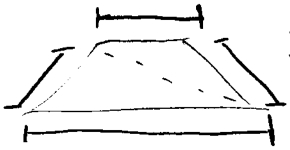
I think that I did extremely well in documenting our process or observations.

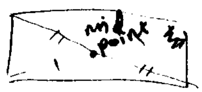
I think that I noted my observations carefully, & that my work "evolved" through my observations in a clear way

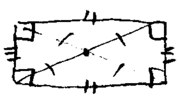
I believe I could have improved my sketch quality a little bit b/c they seem a little sloppy.

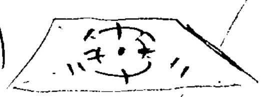
Mar. 3, 2009

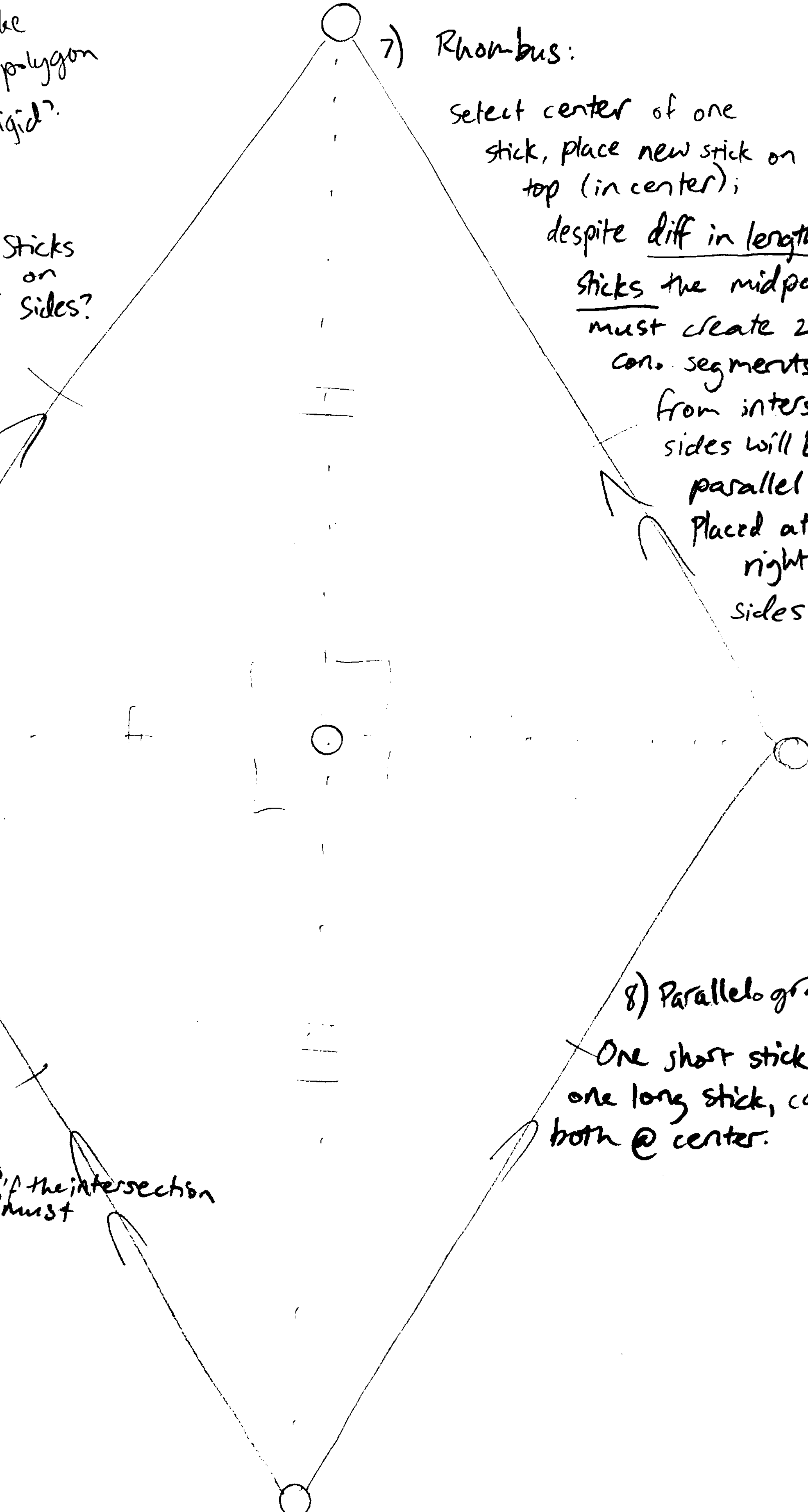
1)  make a polygon rigid?

iso. trap 2)  Sticks on Sides?

3) 

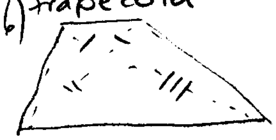
4) 

5) 



7) Rhombus:

Select center of one stick, place new stick on top (in center); despite <u>diff in lengths of sticks</u> the midpoint must create 2 con. segments out from intersection. sides will be parallel auto. Placed at right angles, sides ≅.

6) trapezoid 

rotated diagonals, one side always parallel; Any point will do

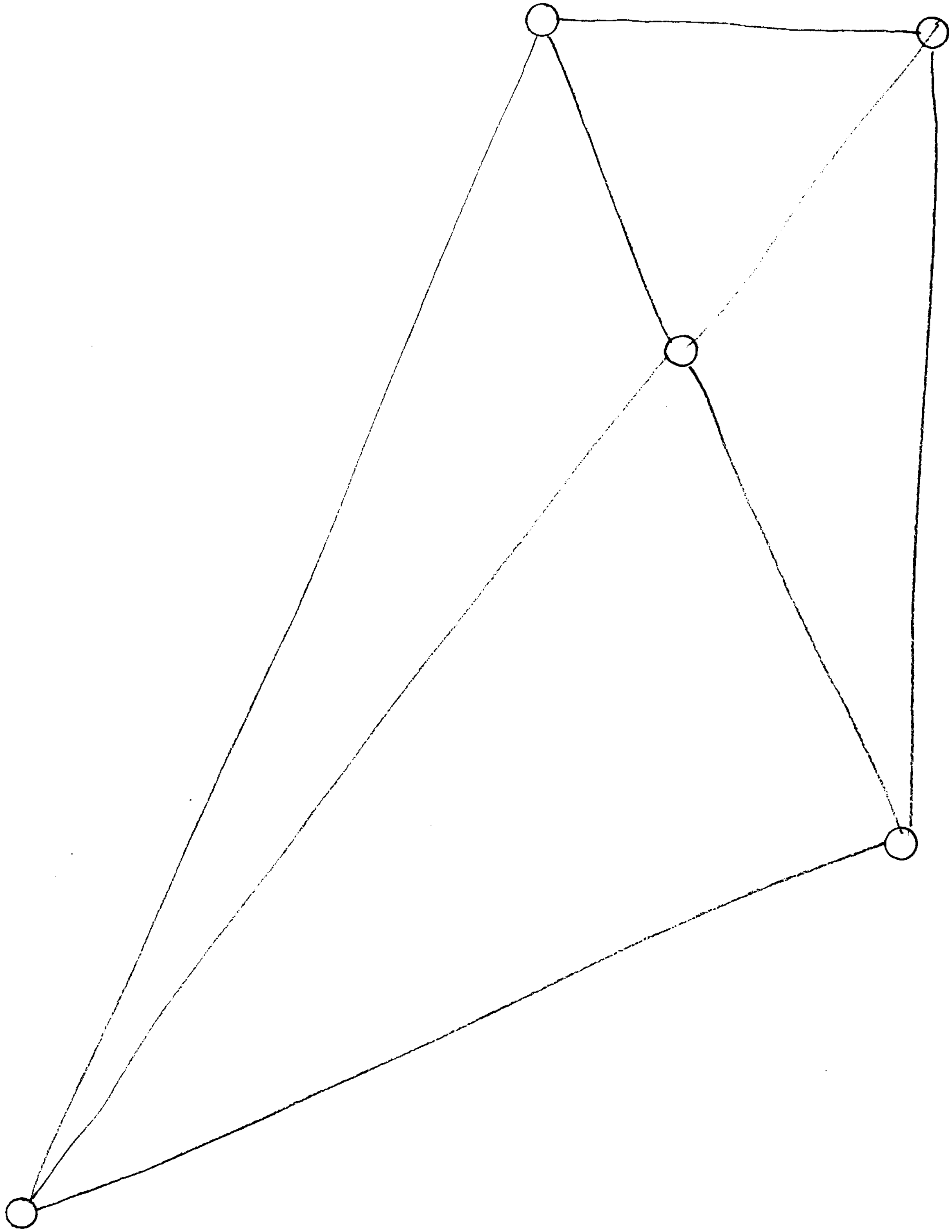
8) Sticks of diff lengths, intersect; one side of the intersection must be congruent

8) Parallelogram:

One short stick, one long stick, connect both @ center.

9)  not con.
disproved

Mar. 3, 2009

10) 

If: the diagonals bisect each other,
and the diagonals are perpendicular,
and the diagonals are different lengths,
then the quadrilateral is a rhombus.

Rhombus: A parallelogram in which all sides are equal.

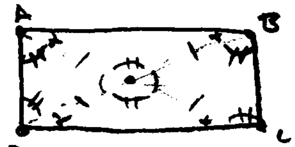
If: the diagonals bisect each other,
~~and the diagonals are not perpendicular,~~
and the lengths are the same,
then the quadrilateral is a rectangle.

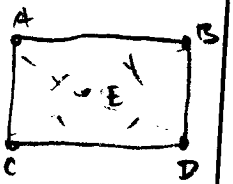
Rectangle: A parallelogram in which all ∠s equal 90°.

360° in quad

1) The diagonals $\overline{DB}$ and $\overline{AC}$ are the same length.	1) Given.
2) The diagonals' bisections are congruent ($\overline{AE}$, $\overline{DE}$, $\overline{BE}$, $\overline{CE}$)	2) Division Property of Segments
3) △AEB, △AED, △BAC, △DAC are isosceles	3) Their

Prove 90°: the sum of a quadrilateral's angles = 360°
Addition of same angles = same angles (addition prop. of angles)
360° ÷ 4 = 90°

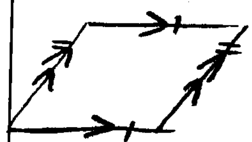


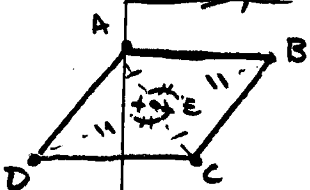


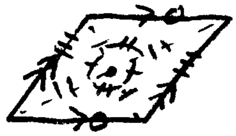
Rectangle:

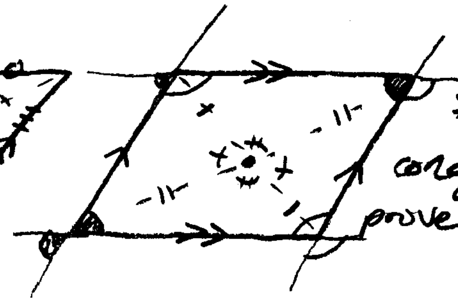
1) $\overline{AD} \cong \overline{CB}$ 1) Given
2) $\overline{AE} \cong \overline{ED} \cong \overline{CE} \cong \overline{BE}$ 2) Division Property of Segments
3) $\angle AEB \cong \angle CED$ 3) Vertical angles are $\cong$.
4) $\angle AEC \cong \angle BED$ 4) ″
5) $\triangle AEB \cong \triangle CED$ 5)

Parallelogram:









Proving triangles congruent... won't prove the conjecture.

1)

1)

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.

Mar. 3, 2009

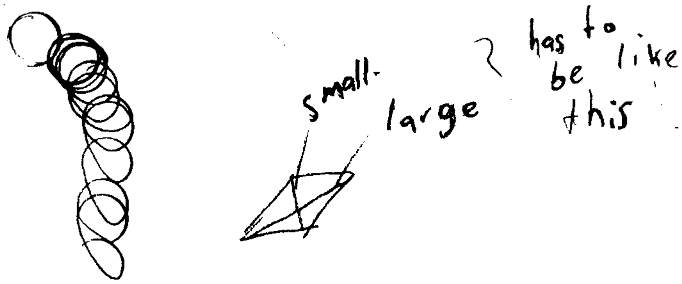
How is it possible to place sticks so that they make rigid quadrilaterals and can be described as one special type or another?

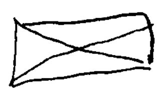
What I think I did well: state my questions, conjectures and made diagrams as I went along.

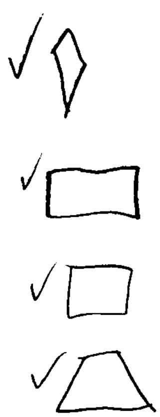
What I think I need to improve on: Recording my first observations which lead to my conjectures.

(1)

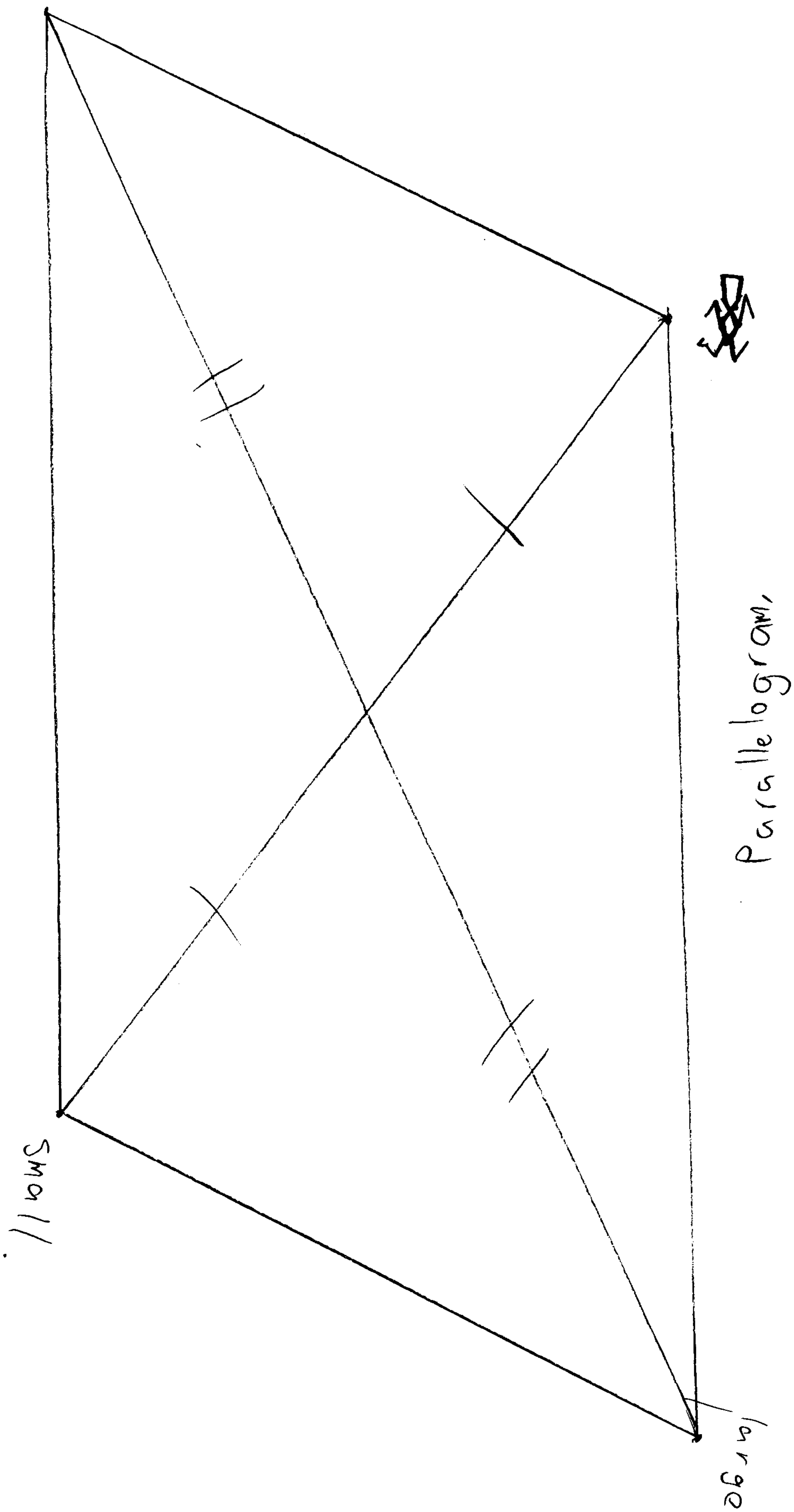
They need to cross each other.

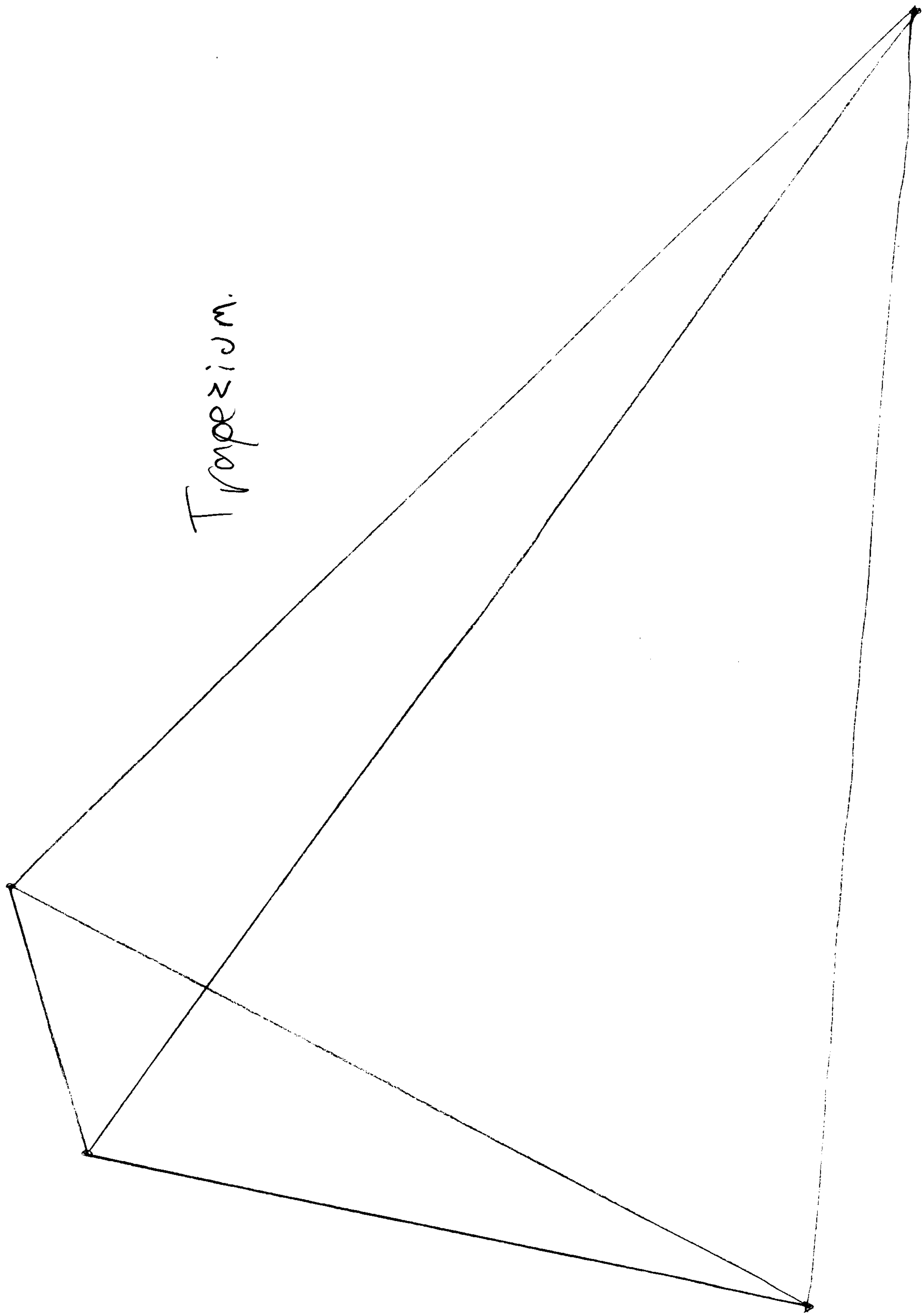




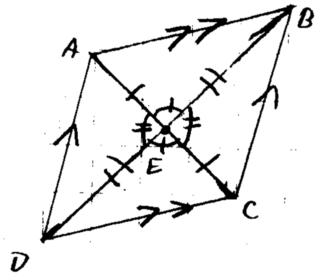


(2)




Trapezium.

Statements	Reasons
① E is the mid-point of $\overline{AC}$	① Given.
② E is the midpoint of $\overline{BD}$.	② Given
③ $\angle AEB \cong \angle DEC$	③ Vertical angles
④ $\angle AED \cong \angle BEC$	④ Vertical angles
⑤ $\Delta DEC \cong \Delta BEA$	⑤ SAS
⑥ $\overline{AB} \parallel \overline{DC}$	



Alternate interior angles proof two lines to be parallel

Geometry Enriched, Block _____ Name ______________________

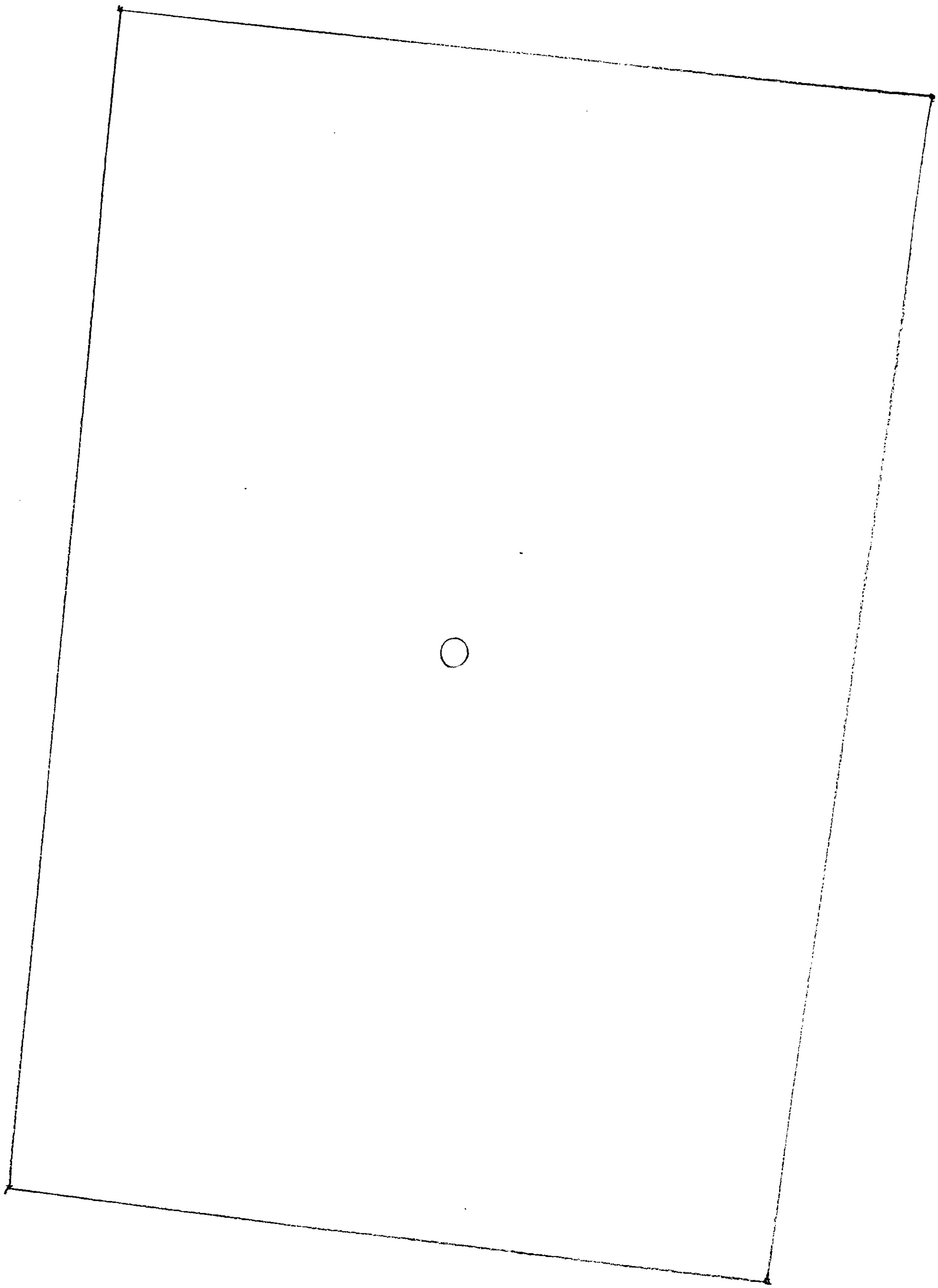
Construction HW #1 Date ______________________

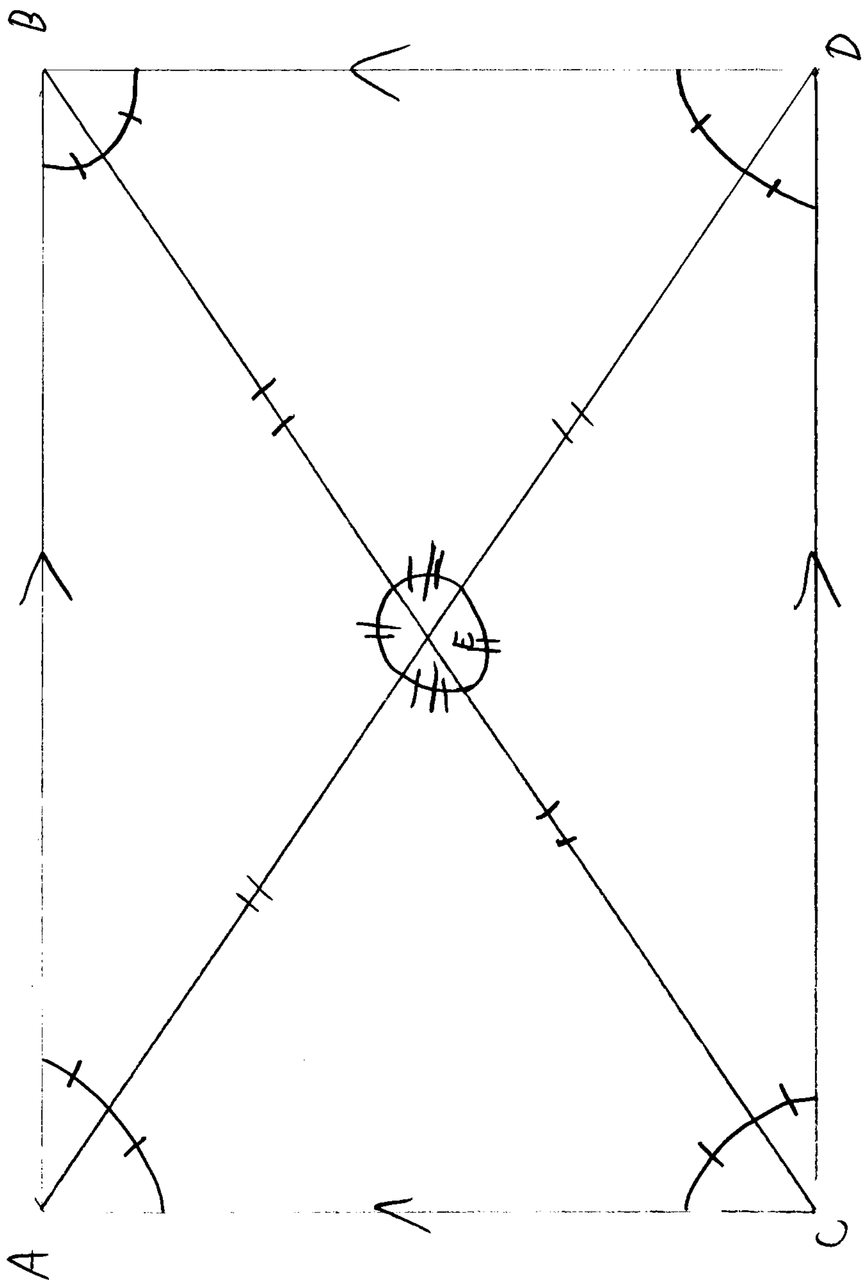
1. Use a compass to draw several circles. Each circle must have the same radius and the center of any new circle drawn must be on the circumference of an already existing circle. See what design you can create.

Statements	Reasons.
① $\overline{AD} \cong \overline{BC}$	① Given
②	

2. Using the circles you've drawn construct an equilateral triangle (note: you may need to add more circles).

Criteria: The circles need to be carefully constructed so that the radius does not change, even a little bit. Keep your pencil sharp, and make sure the intersections are precise. And the straight lines must be constructed with a straightedge! Keep practicing!




B
D
E
A
C

• How many shapes do we need to do?
• How can we explain the diagonals on a trapezoid?
• Do we have a lot of information or little?

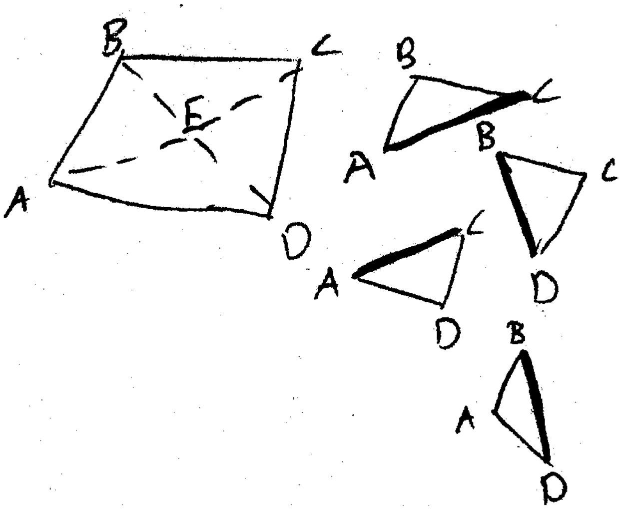
I think I did well when I was drawing the diagonals of each polygon. And finding the portion of them.

I think I can improve by taking more notes and ideas so that I don't losse track of what I've done

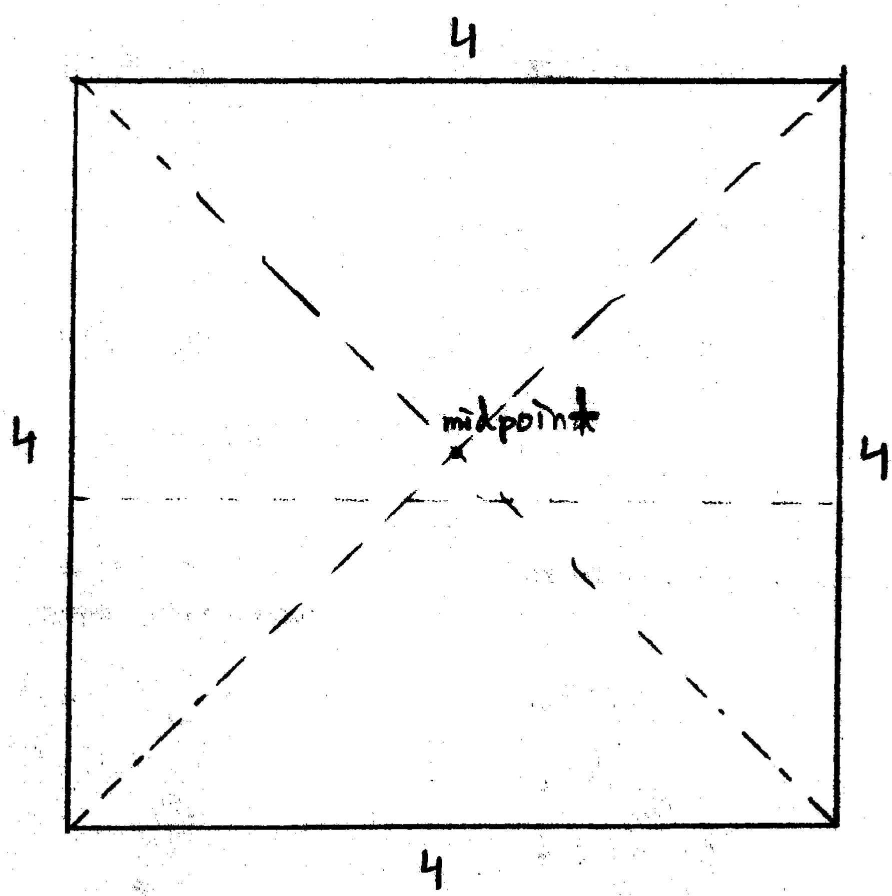
• All sticks have 9 holes; $2(9^2)$ posibilities

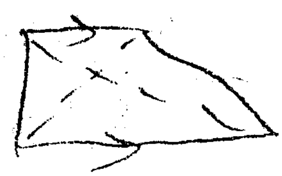
$2(81)$

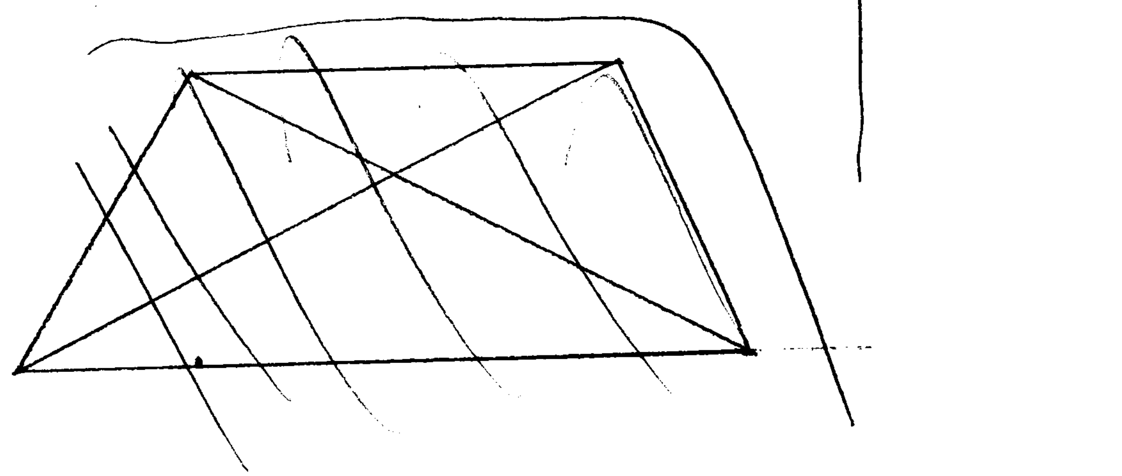
162

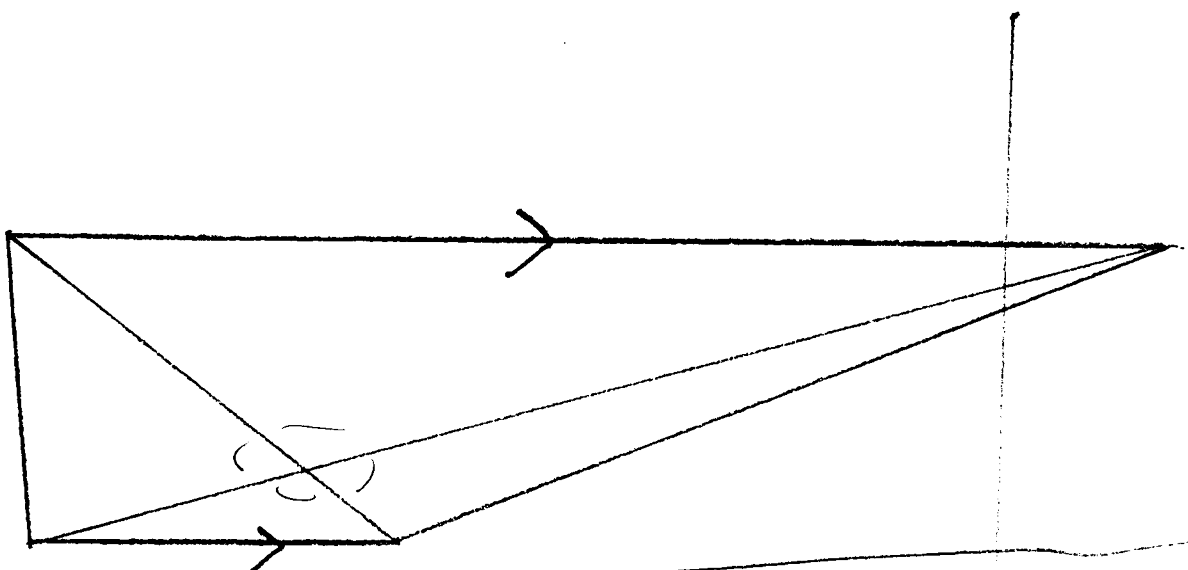


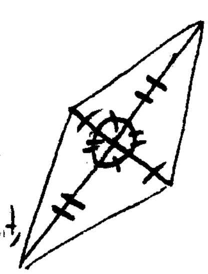
Blk 1 3/3/09











• diagonals bisect	• If a seg. is divided where the two new seg. are congruent, then the segment is bisected
• diagonals not perpendicular	• if supplementary angles are, marked as 2 diff. lengths, then they are not perpendicular

If the diagonals bisect each other

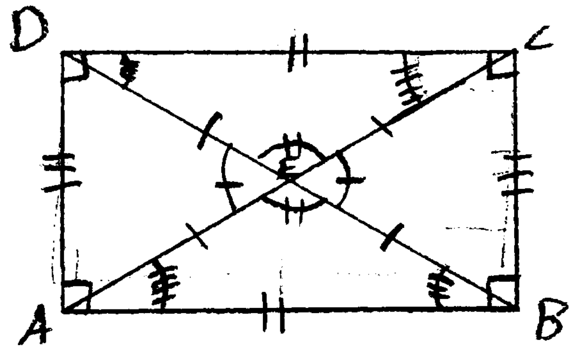
~~and the diagonals are not perpendicular~~

and the diagonals have same lengths

then the quadrilateral is a rectangle.

Rectangle: A parallelogram in which all angles are equal to 90°.

• $\triangle ABE \cong \triangle CED$	• SAS
• $\overline{CD} \cong \overline{AB}$	• CPCTC



Blk 1

How do you solve for a trapezoid only with the diagonals?

I think I did well in drawing the shapes. But I think I can improve on writeing down my thoughts.

B1

kite

Sh

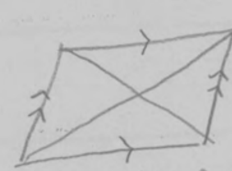
lo

- only one stick can be in the center
- two lines always perpendicular

lo

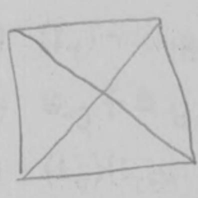
lo

parallelogram



- square, rect
- long stick short

Square



- fastened middle of each line

lo

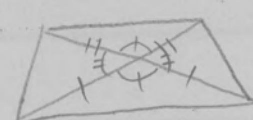
lo

- Same amount of holes on each side of line
- lines perpendicular

rhombus

- short long - has to be perpendicula
- long long -

trapezoid



- can't use center
- ~~long short~~
- long long
- angle doesn't matter

rectangle

- fastened middle
- doesn't have to be perpendicular

Trapezium

- any two sticks in any hole

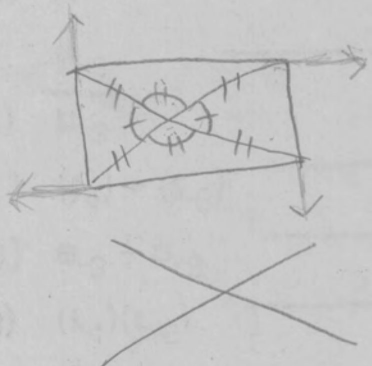
* All - can't use top or bottom hole because that forms a triangle

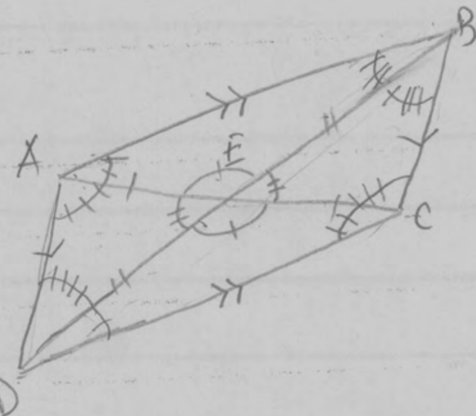
Kite

Non Iso Trap

- fastened at the same number hole
- can't be fastened in center

rectangle





Proof Parallelogram

statement	reason
① $\triangle CED \cong \triangle AEB$	① SAS
② $\triangle BEC \cong \triangle AED$	② SAS
③ $\angle BDC \cong \angle ABD$	③ CPCTC
⑤ $\overline{AB} \parallel \overline{DC}$	⑤ alternate interior angles
⑥ $\overline{AD} \parallel \overline{BC}$	⑥ alternate interior
④ $\angle BCA \cong \angle CAD$	④ CPCTC

How can we prove the rectangle's corners are 90° angles?

I think I did well in organizing my thoughts because each shape has its own section with observations. I think I can improve by using lines to seperate the work so that two shape's observation won't look like one. Write more notes.

trapezoid, kite, trapezium, rhombus, square, rectangle, parallelogram

1 long & 1 short (or parrallelogram)

center point on both can create a rhombus see a

center point on one can create a kite see b

2 long

center point on both

square c

rectangle d

parallelogram c

rhombus c

center point on one

kite e

center point on none, but same distance

trapezoids f

rhombus

center points on both sticks, any combination of sticks

Kite

center point on one stick, any combination of sticks

Square

center points on both sticks, both long sticks, 90° angles

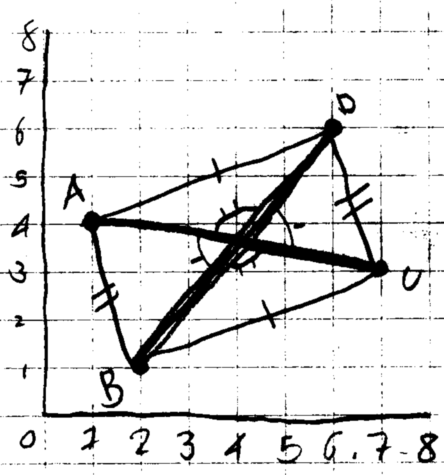
Parallelogram

center points on both sticks, any combination of sticks

Rectangle

center points on both sticks, both long sticks trapezoid.

both points equidistant to end points, both long sticks



A	(1 , 4)	
B	(2 , 1)	
C	(7 , 3)	
D	(6 , 6)	

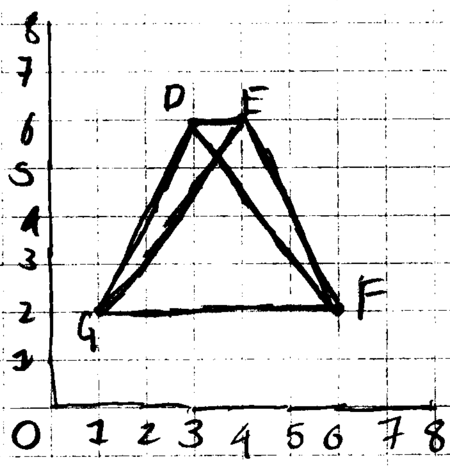
$\frac{3-1}{7-2} = \frac{2}{5}$

$\frac{6-4}{6-1} = \frac{2}{5}$

$\frac{4-1}{1-2} = \frac{3}{-1} = -3$

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

Statements	Reasons
m for BC is $\frac{2}{5}$	slope formula and points
m for AD is $\frac{2}{5}$	slope formula and points
AD ∥ BC	slopes are =
m for AB is -3	slope formula and points
m for CD is -3	slope formula and points
AB ∥ CD	slopes are =
▭ABCD is a parallelogram	def. of parallelogram



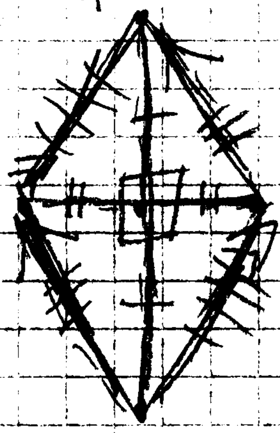
D	(3 , 6)
E	(4 , 6)
F	(6 , 2)
G	(1 , 2)

$\frac{6-6}{4-3} = \frac{0}{1} = 0$

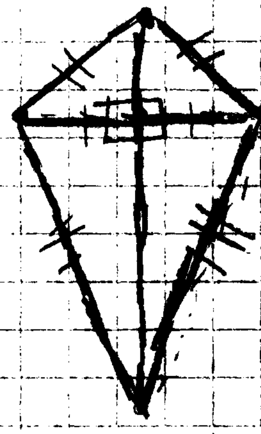
$\frac{2-2}{6-1} = \frac{0}{5} = 0$

statements	reasons
m for ED is 0	slope formula and points
m for FG is 0	slope formula and points
ED ∥ FG	slopes are =
⏢ DEFG is a trap.	def. of trap.

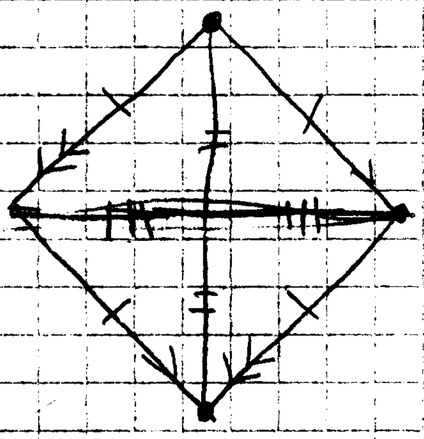
a



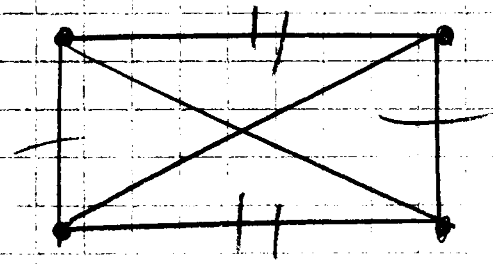
b



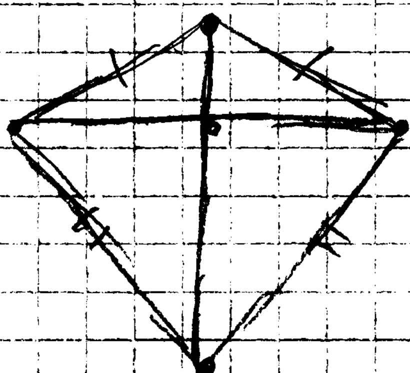
c



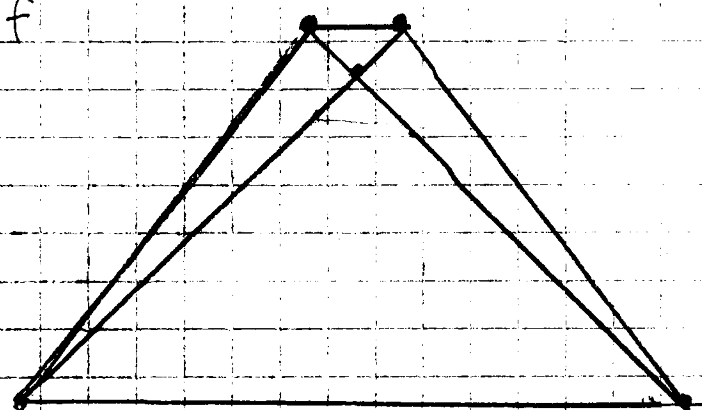
d

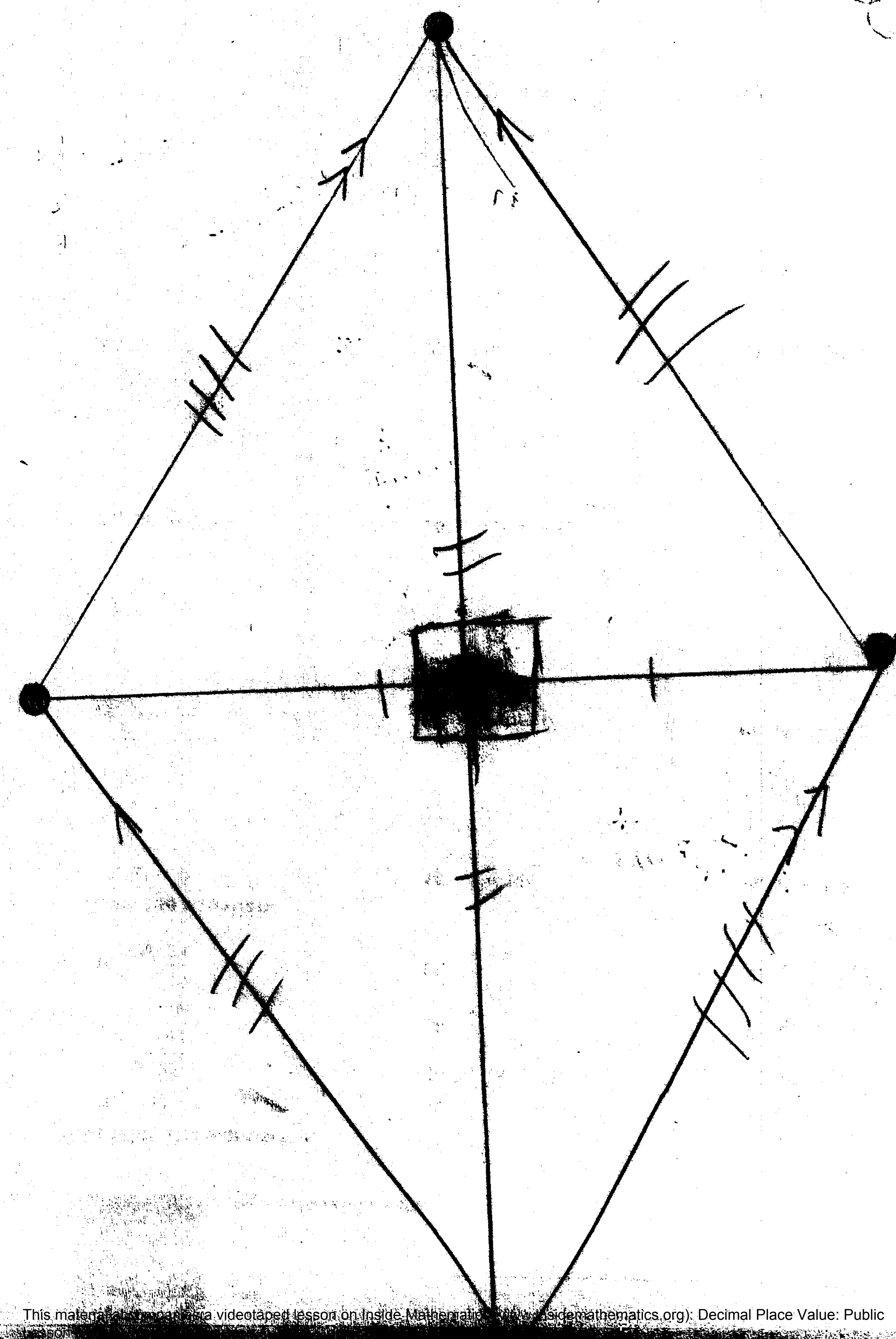


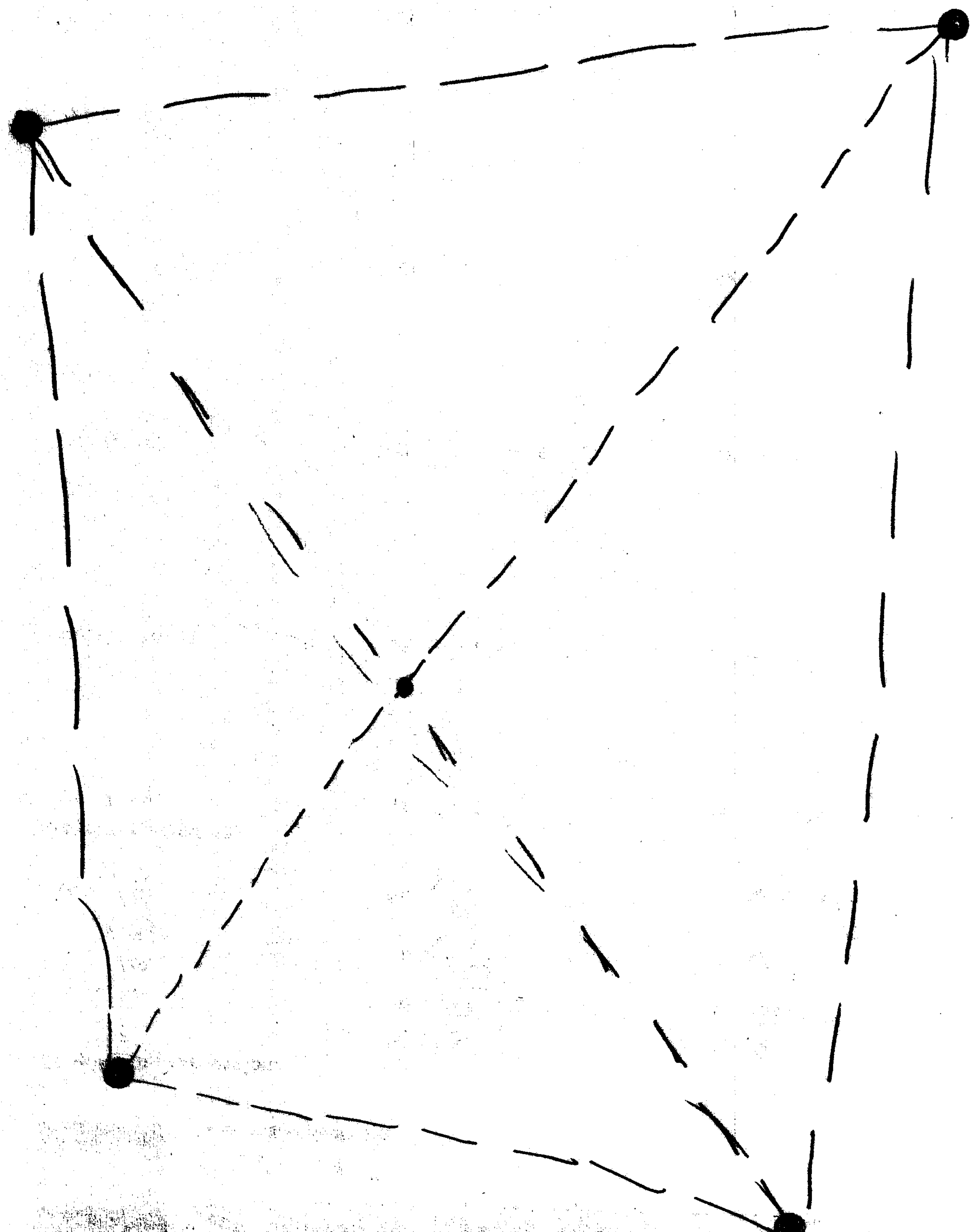
e



f







Bl. 2 3-3-09

Which sticks have the most shapes that can be made?

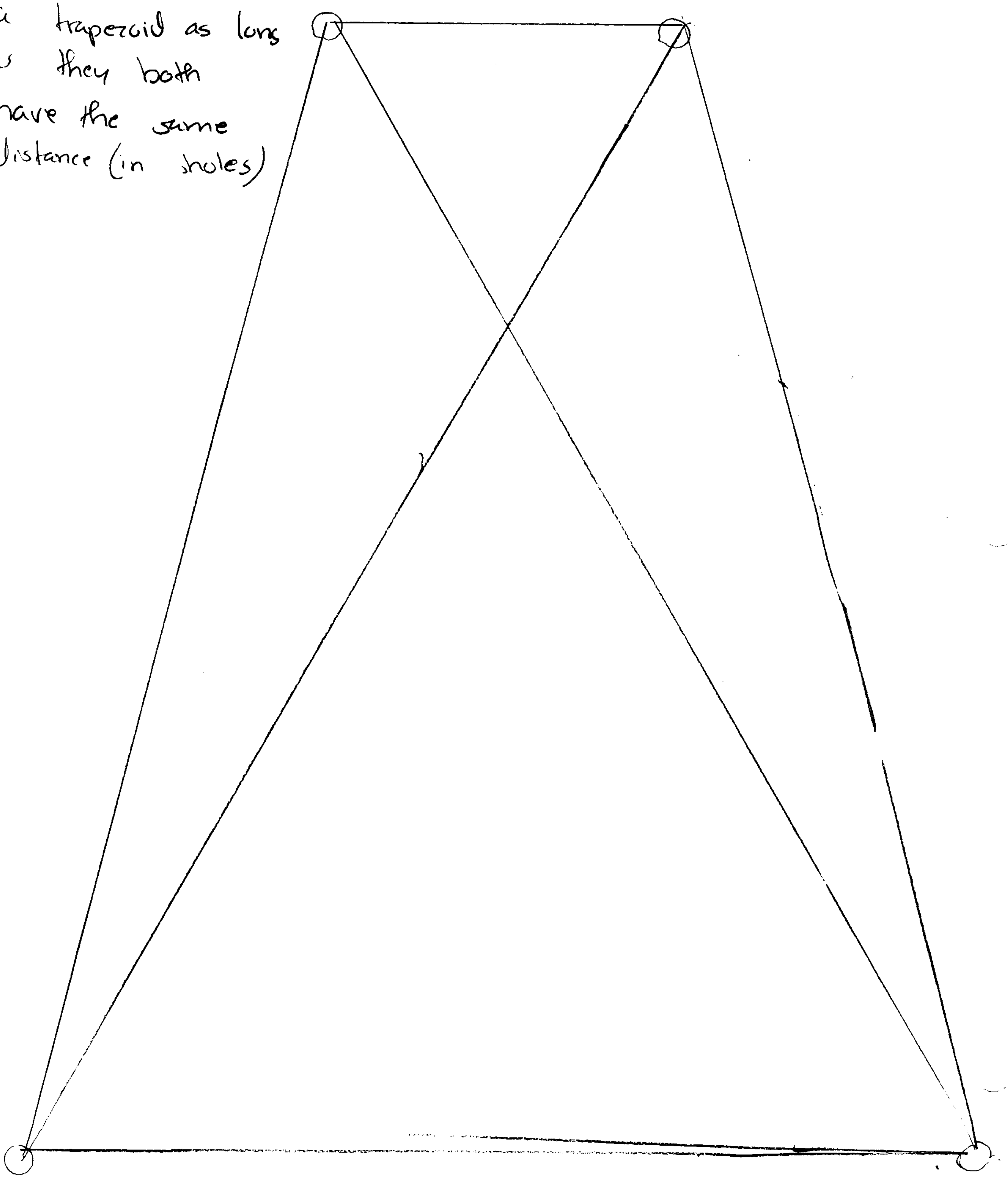
Why doesn't the kite maker not make custom orders?

What I think I did well:
getting information on the paper about the shapes we made.

What I thik I could impove nex t time:
being specific yetclear in my data.

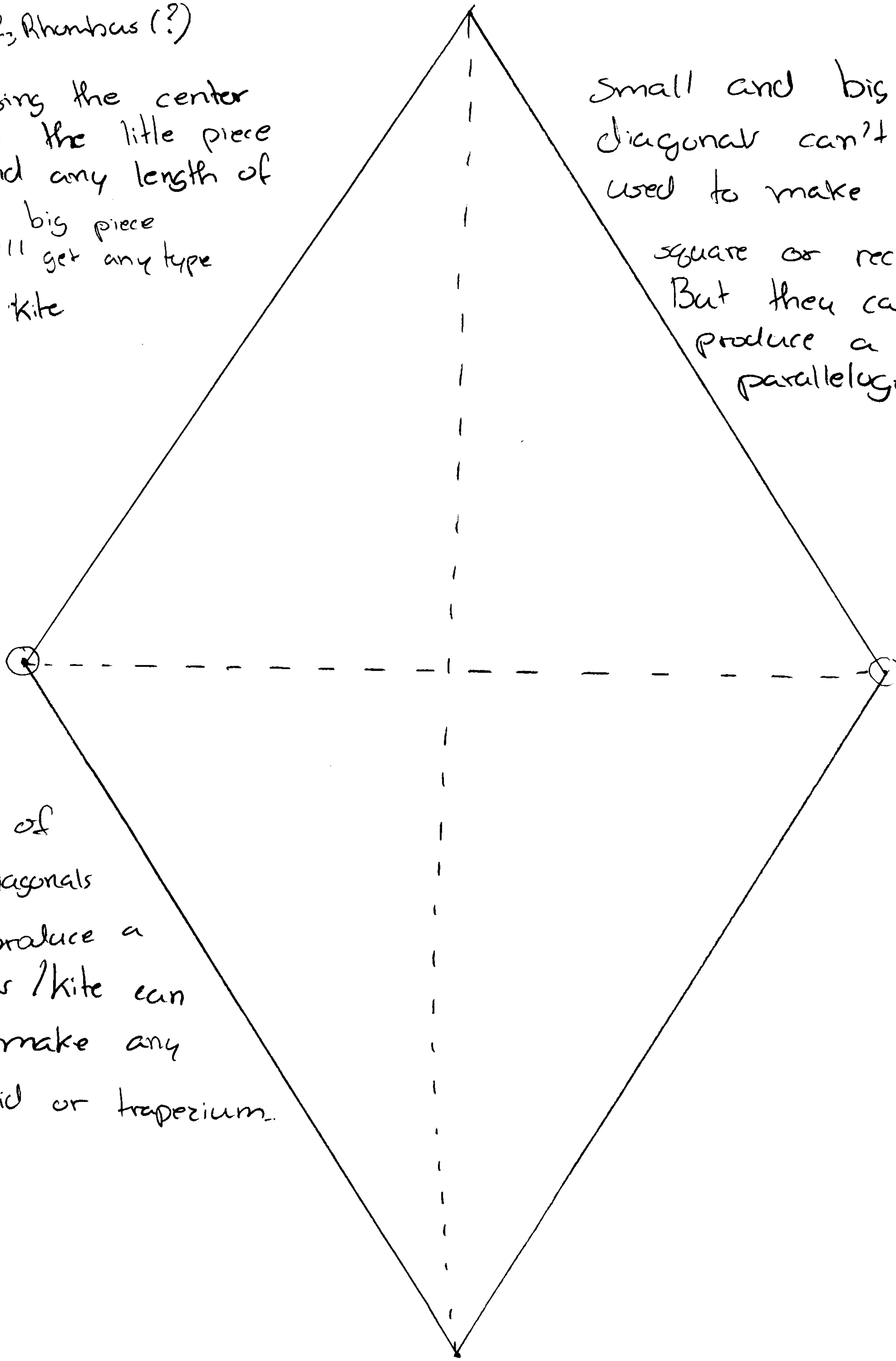
1. Trapezoid (?)

Using the two big pieces, you can make a trapezoid as long as they both have the same distance (in holes)



2, Rhombus (?)

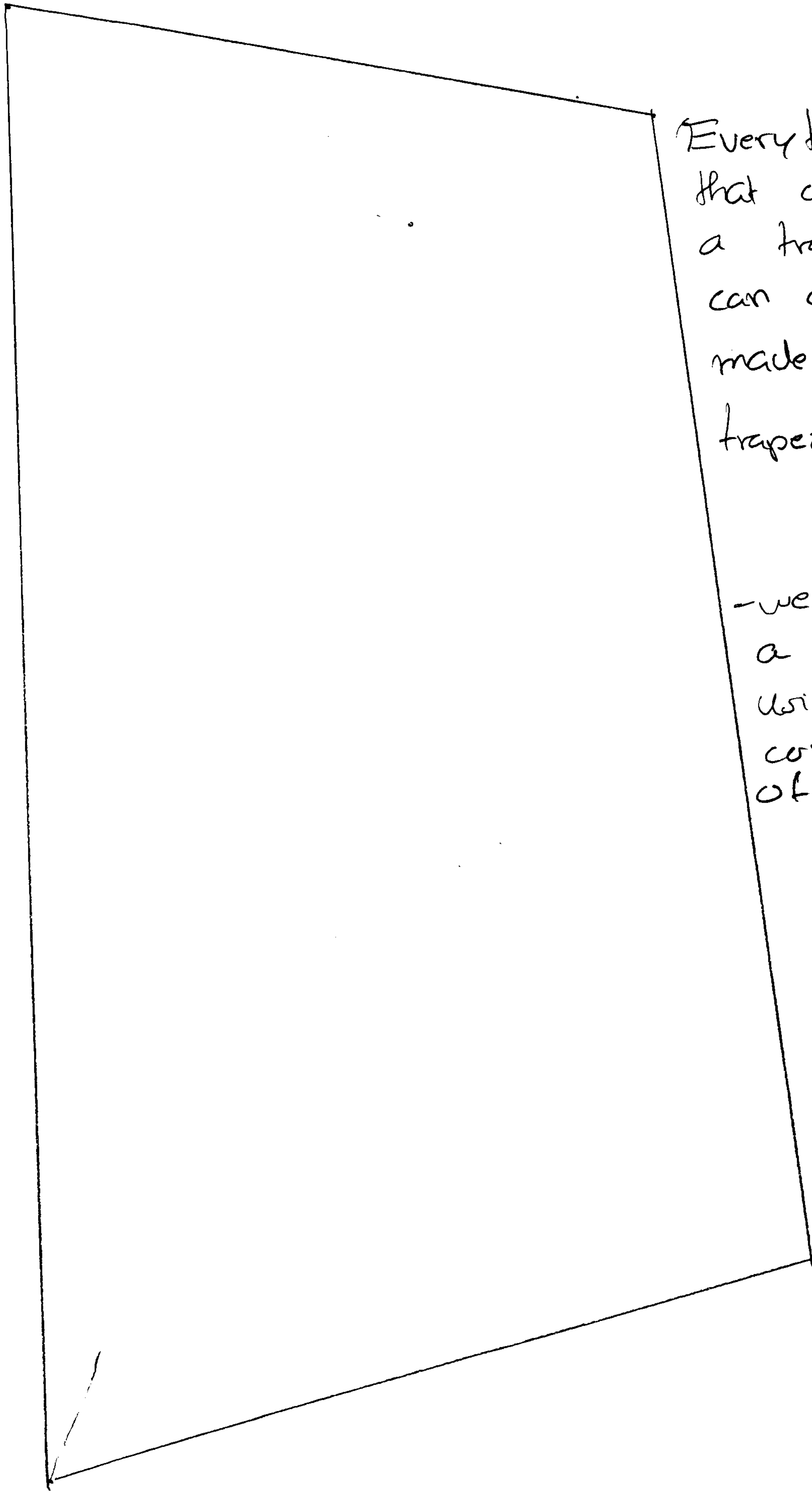
using the center of the little piece and any length of the big piece you'll get any type of kite



Small and big diagonals can't be used to make a square or rectangle. But they can produce a parallelogram.

Any of the diagonals that produce a rhombus / kite can also make any trapezoid or trapezium.

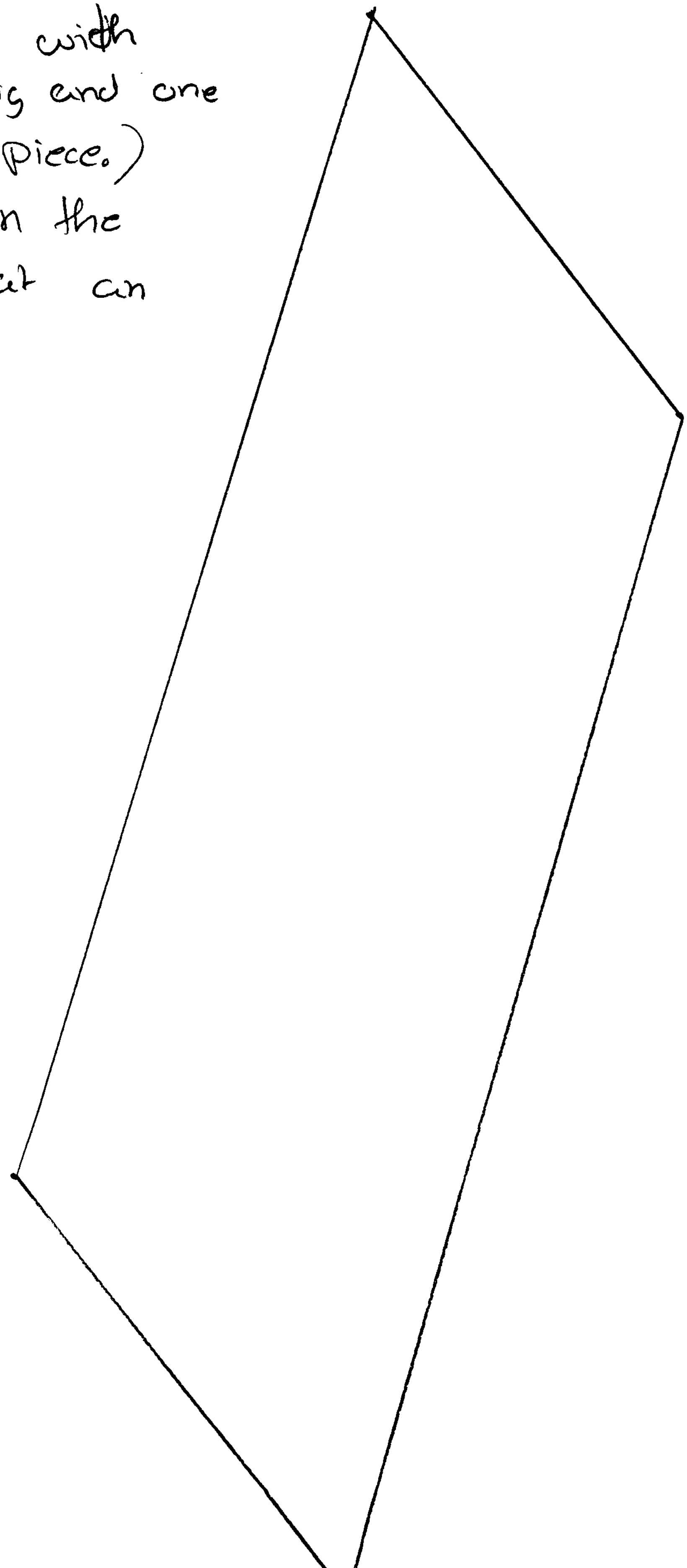
3. Trapezium



Every thing that can make a trapezoid can also be made into a trapezium.

- we can produce a trapezium using any combination of diagonals.

4. Parallelogram (Made with one big and one small piece.) Both in the center at an angle



I wonder if we can produce any other quadrilaterals using all three of the pieces? other than a trapezoid

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.

I think that we did good as a group because when ever we found out about something that was new we shared it with the group and wrote it down.

I think I can improve by thinking more about the work geometrically over too much tinkering.
