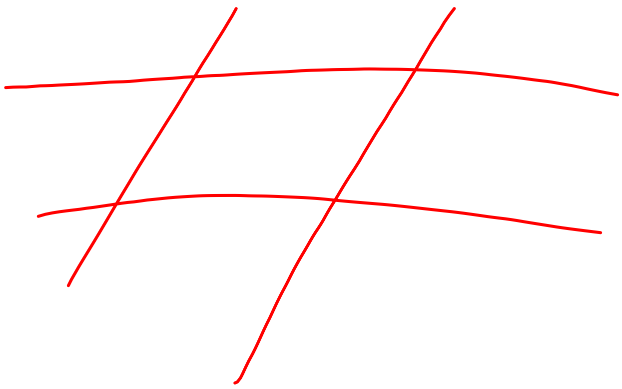
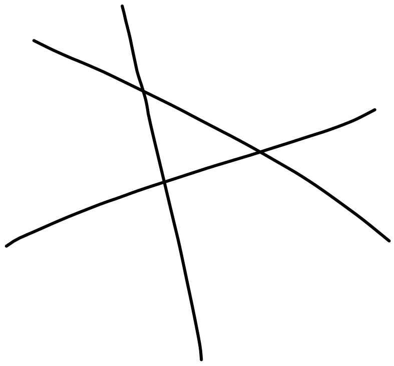
Ch 7 Review Problems pp. 292-295 #1-53 all - due Wednesday 01/25

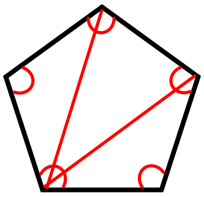
Quiz TOMORROW (Fri. 01/20) on parallel lines (Ch 6) and parallelograms (Ch 7)





The figure below suggests that the sum of the angles of a pentagon is 3x180°=540°.

If the pentagon is equiangular, then each angle is 540°/5=108°.



46. What is the sum of the angles of a hexagon

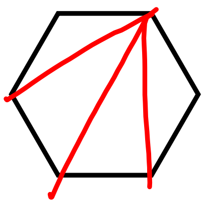
$4(180) = 720°$

47. If the hexagon is equiangular, how large is each angle?

$720/6 = 120°$

48. What is the sum of the angles of an octagon?

$6(180) = 1080°$



49. If the octagon is equiangular, how large is each angle?

$1080°/8 = 135°$

50. What, in terms of n, is the sum of the angles of an n-gon?

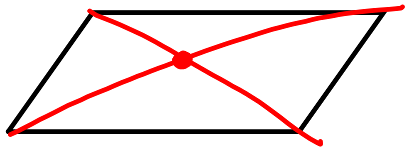
$(n-2)\cdot 180$

51. If the n-gon is equiangular, how large is each angle in terms of n?

$$\frac{(n-2)\cdot 180}{n}$$

7.2 – Parallelograms and Point Symmetry

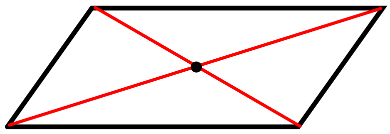
Def: A parallelogram is a quadrilateral whose opposite sides are parallel.



A figure has point symmetry if it looks exactly the same when it is rotated about a point.

Def: Two points are symmetric with respect to a point iff it is the midpoint of the line segment joining them.

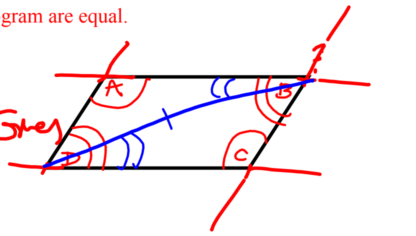
Parallelograms have point symmetry about the point in which their diagonals intersect.



Theorem 25: The opposite sides and angles of a parallelogram are equal.

Given: ABCD is a parallelogram.

Prove: AB=DC, AD=BC, A= C, and B= D.

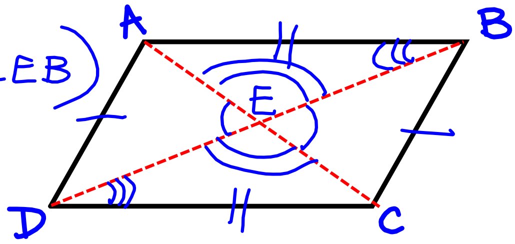


1. ABCD is a parallelogram — Given
2. AB ∥ DC & AD ∥ BC — (def. of parallelogram
3. ∠A & ∠D are supplementary
   ∠A & ∠B are supplementary
   ∠B & ∠C are supplementary
   ∠C & ∠D are supplementary — parallel lines form supplementary interior ∠s on same side of transversal
4. ∠A = ∠C
   ∠B = ∠D — supplements of the same angle are equal
5. Draw BD — 2 points define a line
6. BD = BD — reflexivity
7. ∠ABD = ∠CDB — parallel lines form equal alternate interior ∠'s
8. △ABD ≅ △CDB — AAS congruence
9. AB = CD & BC = AD — corresponding parts of congruent △'s are =

Theorem 26: The diagonals of a parallelogram bisect each other.

Given: ABCD is a parallelogram with diagonals AC and BD.

Prove: AC and BD bisect each other. (AE = EC & DE = EB)



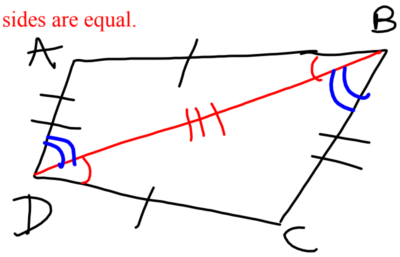
Proof

1. AB = CD & AD = BC (opposite sides of a parallelogram are =)
2. ∠AED = ∠CEB, ∠AEB = ∠CED — Vertical ∠'s are =
3. AB ∥ CD — opposite sides of a parallelogram are parallel
4. ∠ABE = ∠CDE — parallel lines (AB & CD) form equal alternate interior angles
5. △ABE ≅ △CDE — AAS congruence
6. AE = EC & DE = EB — corresponding parts of congruent triangles are equal
7. AC & BD bisect each other — a line segment divided into 2 equal segments is bisected

7.3 – More on Parallelograms

A quadrilateral is a parallelogram if:
1. its opposite sides are parallel
2. its opposite sides are equal
3. its opposite angles are equal
4. two opposite sides are parallel and equal
5. its diagonals bisect each other

Theorem 27: A quadrilateral is a parallelogram, if its opposite sides are equal.
Given: In quadrilateral ABCD, AB=DC and AD=BC
Prove: ABCD is a parallelogram



1. Draw diagonal BD — 2 pts define a line
2. BD = BD — reflexivity
3. △ABD ≅ △CDB — SSS congruence
4. ∠ABD = ∠CDB — corresponding parts of congruent △'s are =
5. AB ∥ DC — equal alternate interior ∠'s mean lines are ∥
6. ∠ADB = ∠CBD — corresponding parts of congruent △'s are =
7. AB ∥ BC — equal alternate interior ∠'s mean lines are parallel
8. ABCD is a parallelogram — a quadrilateral w/ both pairs of opposite sides parallel is a parallelogram