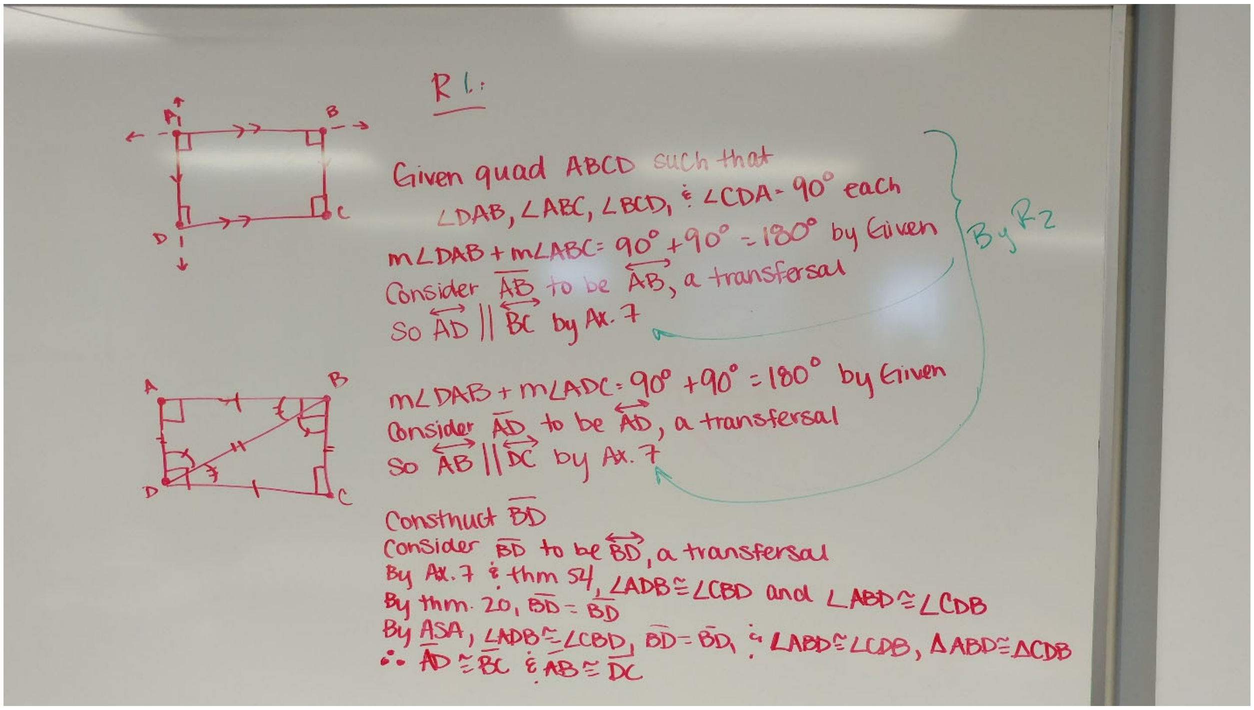
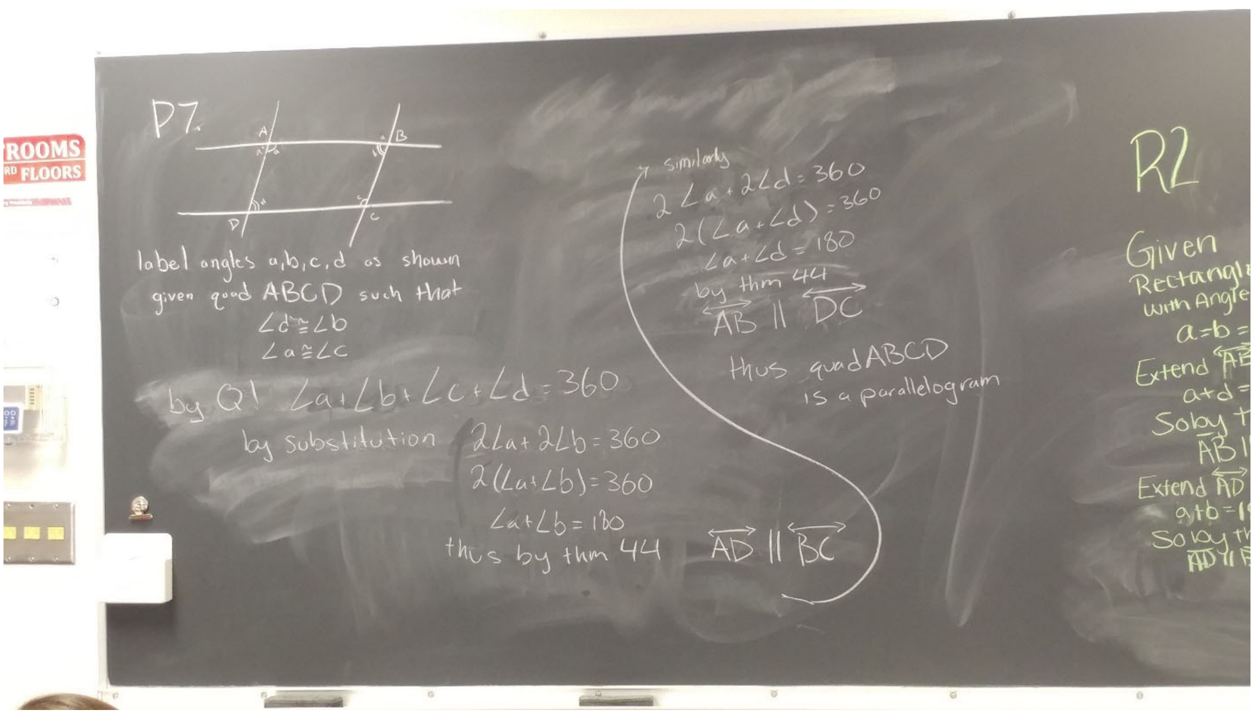
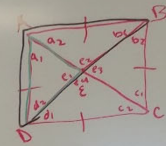

R1:
A
B
C
D
Given quad ABCD such that
∠DAB, ∠ABC, ∠BCD, & ∠CDA = 90° each
m∠DAB + m∠ABC = 90° + 90° = 180° by Given
Consider AB to be AB, a transfersal
So AD || BC by Ax. 7
By R2
m∠DAB + m∠ADC = 90° + 90° = 180° by Given
Consider AD to be AD, a transfersal
So AB || DC by Ax. 7
Construct BD
Consider BD to be BD, a transfersal
By Ax. 7 & thm 54, ∠ADB ≅ ∠CBD and ∠ABD ≅ ∠CDB
By thm. 20, BD = BD
By ASA, ∠ADB ≅ ∠CBD, BD = BD, & ∠ABD ≅ ∠CDB, ΔABD ≅ ΔCDB
∴ AD ≅ BC & AB ≅ DC


P7.
A
B
C
D
label angles a,b,c,d as shown
given quad ABCD such that
∠d ≅ ∠b
∠a ≅ ∠c
by Q! ∠a + ∠b + ∠c + ∠d = 360
by substitution 2∠a + 2∠b = 360
2(∠a + ∠b) = 360
∠a + ∠b = 180
thus by thm 44 AD || BC
similarly
2∠a + 2∠d = 360
2(∠a + ∠d) = 360
∠a + ∠d = 180
by thm 44
AB || DC
thus quad ABCD
is a parallelogram
R2
Given
ROOMS
FLOORS

H6

Given rhombus ABCD s.t. $\overline{AB} \cong \overline{BC} \cong \overline{DC} \cong \overline{DA}$ (1)



Construct diagonals $\overline{AC}$ and $\overline{DB}$

Consider ΔABD and ΔCBD

By Thm 20, $\overline{DB} = \overline{DB}$ (2)

By SSS (1,2) $\Delta ABD \cong \Delta CBD$ (3)

Consider ΔDAC and ΔBAC

By Thm 20 $\overline{AC} = \overline{AC}$ (4)

By SSS (1,4) $\Delta DAC \cong \Delta BAC$ (5)

Name $\overline{AC} \cap \overline{DB} = \mathcal{E}$

name angle measures as shown

Because (3), $a_1 + a_2 = c_1 + c_2$

$b_1 = b_2$

$d_1 = d_2$

Because (5) $d_1 + d_2 = b_1 + b_2$

$a_1 = a_2$

$c_1 = c_2$

(6) So, $a_1 + a_2 = 2a_1$

$2d_2 = 2b_1$

$d_2 = b_1$ *

Cross check: Isosceles△.

By Thm 57, $d_2 + a_1 + a_2 + b_1 = 180°$ (ΔADB)

By substitution (6), $2a_1 + 2d_2 = 180°$

So, $a_1 + d_2 = 90°$ (7)

Consider $\Delta A\mathcal{E}D$, By Thm 57, $a_1 + d_2 + e_1 = 180°$

By substitution (7) $90° + e_1 = 180°$

So, $\boxed{e_1 = 90°}$

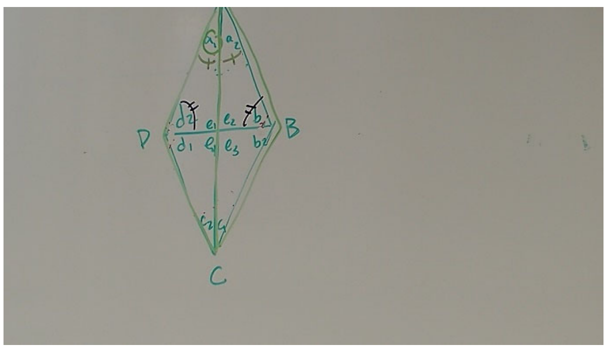
By Thm 25, $e_1 + e_2 = e_1 + e_4 = 180°$

So, $e_2 = 90°$ and $e_4 = 90°$

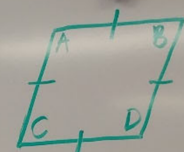
By Thm 25, $e_4 + e_3 = 180°$

So $e_3 = 90°$

∴ the diagonals are ⊥



H3: Given Rhombus as labeled



then ① $\angle A \cong \angle D$, ② $\angle B \cong \angle C$ (H4)

By Q1, we know that the measure of all interior angles in a quad. = 360°

So ③ $\angle A + \angle B + \angle C + \angle D = 360$

By sub. 1 and 2 into 3 we get $2\angle A + 2\angle B = 360$

$2(\angle A + \angle B) = 360$

④ $\angle A + \angle B = 180$

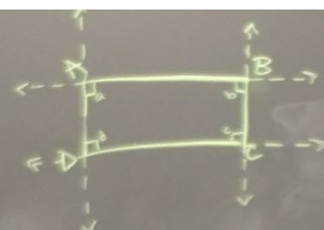
By sub. 4 into 3: $180 + \angle C + \angle D = 360$

$\angle C + \angle D = 180$

⑤ $\angle A + \angle C = 180$ (sub 2)

$\angle B + \angle D = 180$ (sub 5 into 3)

R2



Given

Rectangle ABCD

with Angle measures as shown

$a = b = c = d = 90°$

Extend $\overleftrightarrow{AB}$ & $\overleftrightarrow{DC}$ so $\overleftrightarrow{AD}$ is a transversal

$a + d = 180$

So by thm 44

$\overleftrightarrow{AB} \parallel \overleftrightarrow{DC}$

Extend $\overleftrightarrow{AD}$ & $\overleftrightarrow{BC}$ so $\overleftrightarrow{AB}$ is a transversal

$a + b = 180$

So by thm 44

$\overleftrightarrow{AD} \parallel \overleftrightarrow{BC}$