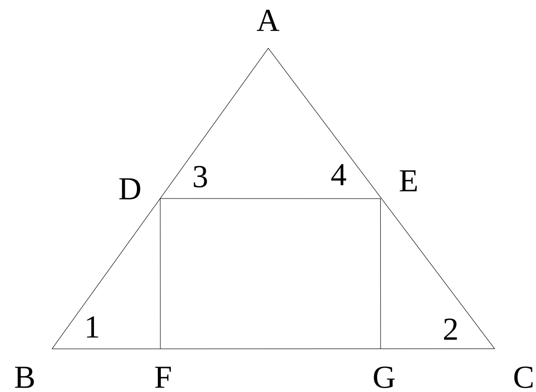
Honors Geometry Semester 1 Proof Review



CHAPTER 3

1) Given: $\angle 1 \cong \angle 2$

D bisects $\overline{AB}$

E bisects $\overline{AC}$

Prove: $\angle 3 \cong \angle 4$

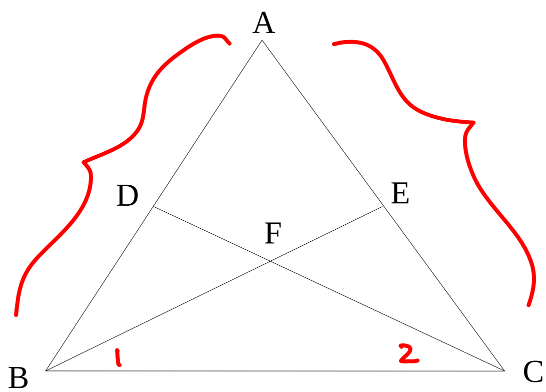
1. $\angle 1 \cong \angle 2$	1. Given
2. D bisects $\overline{AB}$	2. Given
3. E bisects $\overline{AC}$	3. Given
4. $\overline{AB} \cong \overline{AC}$	4. If $\triangle$ → $\triangle$
5. $\overline{AD} \cong \overline{AE}$	5. Division prop.
6. $\angle 3 \cong \angle 4$	6. If $\triangle$ → $\triangle$

2) Given: $\overline{AB} \cong \overline{AC}$

D is a midpoint of $\overline{AB}$

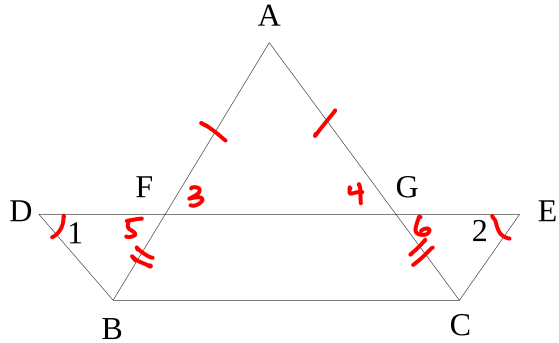
E is a midpoint of $\overline{AC}$

Prove: ΔFBC is isosceles



1. $\overline{AB} \cong \overline{AC}$	1. Given
2. D is the midpt of $\overline{AB}$	2. Given
3. E is the midpt. of $\overline{AC}$	3. Given
4. $\angle ABC \cong \angle ACB$	4. If $\triangle$ → $\triangle$
5. $\overline{DB} \cong \overline{EC}$	5. Division prop.
6. $\overline{BC} \cong \overline{BC}$	6. Reflexive prop.
7. $\Delta DBC \cong \Delta ECB$	7. SAS
8. $\angle 1 \cong \angle 2$	8. CPCTC
9. ΔFBC is isosceles	9. If at least 2 $\angle$'s of a Δ are $\cong$ → isosceles

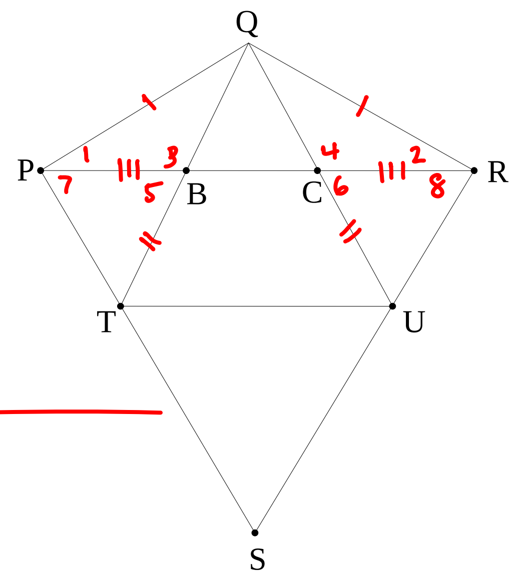
3) Given: $\overline{AF} \cong \overline{AG}$
$\overline{BF} \cong \overline{CG}$
$\angle 1 \cong \angle 2$
Prove: $\overline{DB} \cong \overline{CE}$



1. $\overline{AF} \cong \overline{AG}$	1. Given
2. $\overline{BF} \cong \overline{CG}$	2. Given
3. $\angle 1 \cong \angle 2$	3. Given
4. $\angle 3 \cong \angle 4$	4. If $\triangle \to \triangle$
5. $\angle 3 \cong \angle 5$, $\angle 4 \cong \angle 6$	5. V.A. are $\cong$
6. $\angle 5 \cong \angle 6$	6. Transitive prop
7. $\triangle DFB \cong \triangle EGC$	7. AAS
8. $\overline{DB} \cong \overline{CE}$	8. CPCTC

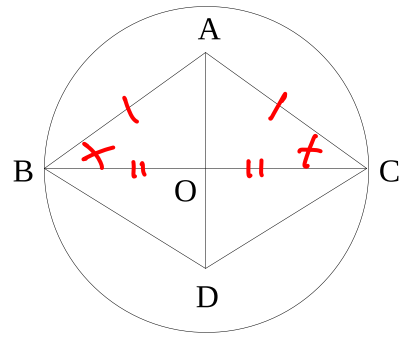
CHAPTER 4.1-4.4

4) Given: $\overline{PC} \cong \overline{BR}$
$\overline{PQ} \cong \overline{QR}$
$\overline{BT} \cong \overline{CU}$
Prove: $\overline{TS} \cong \overline{US}$



1. $\overline{PC} \cong \overline{BR}$	1. Given
2. $\overline{PQ} \cong \overline{QR}$	2. Given
3. $\overline{BT} \cong \overline{CU}$	3. Given
4. $\overline{PB} \cong \overline{CR}$	4. Subtraction prop.
5. $\angle 1 \cong \angle 2$	5. If $\triangle \to \triangle$
6 $\triangle QPB \cong \triangle QRC$	6. SAS
7. $\angle 3 \cong \angle 4$	7. CPCTC
8. $\angle 3$ and $\angle 5$ supp. $\angle 4$ and $\angle 6$ supp.	8. If 2 $\angle$'s form a str. $\angle$ → $\angle$'s supp
9. $\angle 5 \cong \angle 6$	9. If 2 $\angle$'s are supp. to $\cong$ $\angle$'s → $\angle$s $\cong$
10. $\triangle PBT \cong \triangle RCU$	10. SAS
11. $\angle 7 \cong \angle 8$	11. CPCTC
12. $\overline{PT} \cong \overline{RU}$	12. CPCTC
13. $\overline{PS} \cong \overline{RS}$	13. If $\triangle \to \triangle$
14. $\overline{TS} \cong \overline{US}$	14. Subtraction prop

5) Given: Circle O
$\angle ABO \cong \angle ACO$
Prove: $\overline{BD} \cong \overline{CD}$

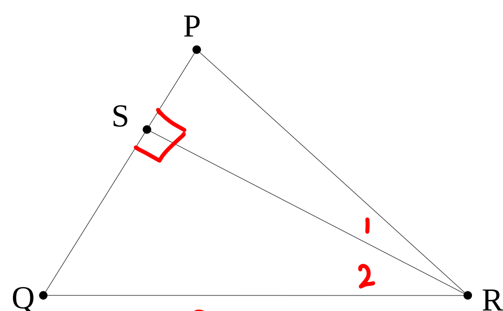


(USE ⊥ BISECTOR/EQUIDISTANCE THEOREMS)

1. Circle O	1. Given
2. $\measuredangle ABO \cong \measuredangle ACO$	2. Given
3. $\overline{BO} \cong \overline{OC}$	3. All radii are $\cong$
4. $\overline{AB} \cong \overline{AC}$	4. If $\triangle \rightarrow \triangle$
5. $\overline{AD}$ is the ⊥ bis. to $\overline{BC}$	5. If 2 pts are equidistant from the endpts of a seg → determine the ⊥ bis. of the seg.
6. $\overline{BD} \cong \overline{CD}$	6. If a pt. is on the ⊥ bisector → it is equidistant from the endpts of the seg

CHAPTER 4.5 - 5.3

6) Given: $\overline{RS} \perp \overline{PQ}$
$\overline{PR} \ncong \overline{QR}$
Prove: $\overrightarrow{RS}$ does not bisect $\angle PRQ$



Either: $\overrightarrow{RS}$ does not bisect $\measuredangle PRQ$ or $\overrightarrow{RS}$ bisects $\measuredangle PRQ$

Assume: $\overrightarrow{RS}$ bisects $\measuredangle PRQ$

$\measuredangle 1 \cong \measuredangle 2$ (def of bisect)

$\measuredangle PSR$ and $\measuredangle QSR$ are rt.'s (If 2 segs ⊥ → form rt.'s)

$\measuredangle PSR \cong \measuredangle QSR$ (If 2 $\measuredangle$'s rt.'s → $\measuredangle$'s $\cong$)

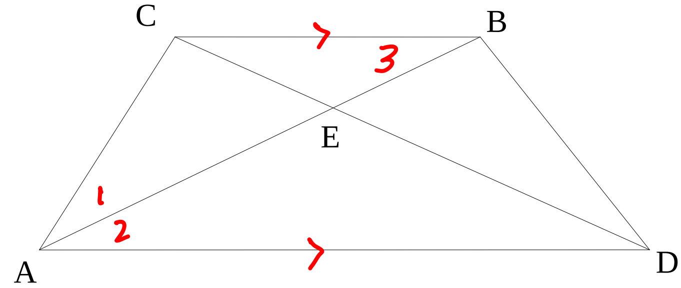
$\overline{SR} \cong \overline{SR}$ (Reflexive prop.)

$\triangle PSR \cong \triangle QSR$ (ASA)

$\overline{PR} \cong \overline{QR}$ (CPCTC)

↳ But this contradicts the given that $\overline{PR} \ncong \overline{QR}$
∴ our assumption is false and $\overrightarrow{RS}$ does not bisect $\measuredangle PRQ$

7) Given: $\overline{AB}$ bisects $\angle CAD$
$\overline{AC} \ncong \overline{CB}$
Prove: $\overline{CB}$ not parallel to $\overline{AD}$



Either: $\overline{CB} \nparallel \overline{AD}$ or $\overline{CB} \parallel \overline{AD}$

Assume: $\overline{CB} \parallel \overline{AD}$

$\angle 1 \cong \angle 2$ (def of bisect)

$\angle 2 \cong \angle 3$ (If $\parallel$ lines $\rightarrow$ alt. int $\angle$'s $\cong$)

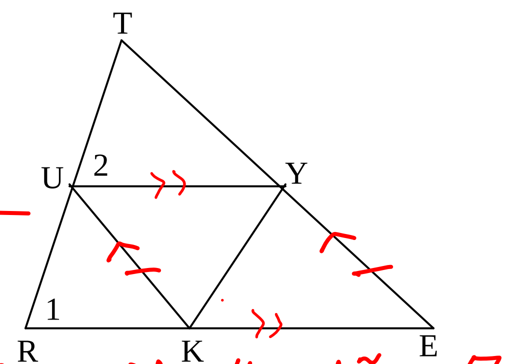
$\angle 1 \cong \angle 3$ (Transitive)

$\overline{AC} \cong \overline{CB}$ (If $\triangle \rightarrow \triangle$)

↳ But this contradicts the given that $\overline{AC} \ncong \overline{CB}$

$\therefore$ our assumption is false and $\overline{CB} \nparallel \overline{AD}$

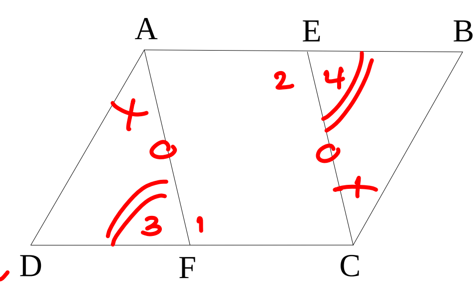
8) Given: $\overline{TE} \parallel \overline{UK}$
$\overline{YE} \cong \overline{UK}$
Prove: $\angle 1 \cong \angle 2$



1. $\overline{TE} \parallel \overline{UK}$	1. Given
2. $\overline{YE} \cong \overline{UK}$	2. Given
3. UKEY is a ▱	3. If one pair of opp. sides $\parallel$ and $\cong$ $\rightarrow$ ▱
4. $\overline{UY} \parallel \overline{KE}$	4. If ▱ $\rightarrow$ opp. sides $\parallel$
5. $\angle 1 \cong \angle 2$	5. If $\parallel$ lines $\rightarrow$ corr. $\angle$'s $\cong$

CHAPTER 5.4 - 5.7

9) Given: AFCE is a parallelogram
$\angle DAF \cong \angle BCE$
Prove: ABCD is a parallelogram



1. AFCE is a ▱	1. Given
2. $\angle 1 \cong \angle 2$	2. If ▱ $\rightarrow$ opp $\angle$'s $\cong$
3. $\angle 1$ and $\angle 3$ supp $\angle 2$ and $\angle 4$ supp	3. If 2 $\angle$'s form a str. $\angle$ $\rightarrow$ $\angle$'s supp.
4. $\angle 3 \cong \angle 4$	4. If 2 $\angle$'s are supp. to $\cong$ $\angle$'s $\rightarrow$ $\angle$'s $\cong$
5. $\overline{AF} \cong \overline{EC}$	5. If ▱ $\rightarrow$ opp. sides $\cong$
6. $\triangle AFD \cong \triangle CEB$	6. ASA.
7. $\overline{AD} \cong \overline{BC}$	7. CPCTC

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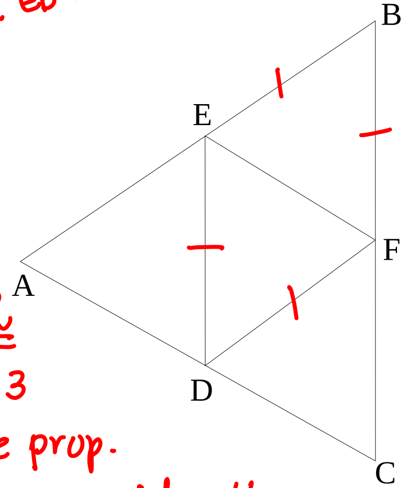
8. $\overline{AE} \cong \overline{FC}$	8. If ▱ → opp. sides ≅
9. $\overline{DF} \cong \overline{EB}$	9. CPCTC
10. $\overline{DC} \cong \overline{AB}$	10. Addition prop
11. ABCD is a ▱	11. If both pairs of opp. sides ≅ → ▱

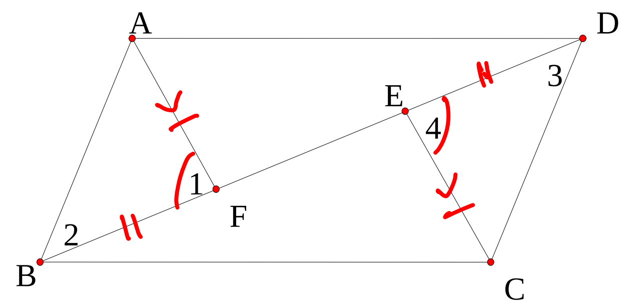
10) Given: EDFB is a rhombus
EFCD is a rhombus
Prove: EBCD is an isosceles trapezoid

need: $\overline{EB} \nparallel \overline{DC}$?



1. EDFB is a rhombus	1. Given
2. EFCD is a rhombus	2. Given
3. $\overline{EB} \cong \overline{ED}$	3. If rhom → all sides ≅
4. $\overline{DC} \cong \overline{ED}$	4. Same as 3
5. $\overline{EB} \cong \overline{DC}$	5. Transitive prop.
6. $\overline{ED} \parallel \overline{FB}$	6. If rhom → opp. sides ∥
7. EBCD is an isos. trap	7. If one pair of opp. sides ∥ and legs ≅ → isos. trap

11) Given: $\overline{AF} \parallel \overline{EC}$
$\overline{AF} \cong \overline{EC}$
$\overline{BE} \cong \overline{FD}$
Prove: ABCD is a parallelogram



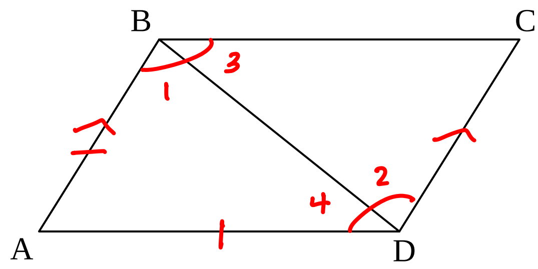
1. $\overline{AF} \parallel \overline{EC}$	1. Given
2. $\overline{AF} \cong \overline{EC}$	2. Given
3. $\overline{BE} \cong \overline{FD}$	3. Given
4. $\overline{BF} \cong \overline{ED}$	4. Subtraction prop.
5. $\angle 1 \cong \angle 4$	5. If ∥ lines → alt. ext. ∠'s ≅
6. $\triangle AFB \cong \triangle CED$	6. SAS
7. $\overline{AB} \cong \overline{DC}$	7. CPCTC
8. $\angle 2 \cong \angle 3$	8. CPCTC
9. $\overline{AB} \parallel \overline{DC}$	9. If alt. int. ∠'s ≅ → ∥ lines
10. ABCD is a ▱	10. If one pair of opp. sides is both ∥ and ≅ → ▱

12) Given: $\overline{AB} \parallel \overline{CD}$

$\angle ABC \cong \angle ADC$

$\overline{AB} \cong \overline{AD}$

Prove: ABCD is a rhombus



1. $\overline{AB} \parallel \overline{CD}$	1. Given
2. $\angle ABC \cong \angle ADC$	2. Given
3. $\overline{AB} \cong \overline{AD}$	3. Given
4. $\angle 1 \cong \angle 2$	4. If $\parallel$ lines $\rightarrow$ alt. int $\angle$'s $\cong$
5. $\angle 3 \cong \angle 4$	5. Subtraction prop.
6. $\overline{BC} \parallel \overline{AD}$	6. If alt. int $\angle$'s $\cong \rightarrow \parallel$ lines
7. ABCD is a ▱	7. If Both pairs of opp. sides $\parallel \rightarrow$ ▱
8. ABCD is a rhombus	8. If a ▱ has a pair of consecutive sides $\cong$ $\rightarrow$ rhombus

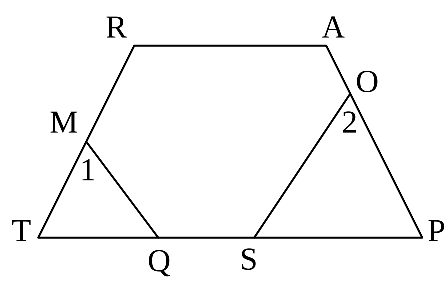
CHAPTER 8

13) Given: TRAP is an isosceles trapezoid with bases $\overline{RA}$ and $\overline{TP}$

M is the midpoint of $\overline{TR}$

$\angle 1 \cong \angle 2$

Prove: $SP \cdot RM = TQ \cdot OP$



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14) Given: WINT is a parallelogram

$\angle 1 \cong \angle 2$

Prove: $IE \bullet TO = TR \bullet IM$