Ch 2- Basic Concepts and Proofs

Agenda:

2.5- Addition and Subtractions Properties
Objective:
- Apply the addition properties of segments and angles
- Apply the subtraction properties and angles

1) Take out Glossary to be checked
2) DO NOW
   - draw a picture for the theorems
   - share and explain drawing with partner
   - edit your drawings if you need to
3) Practice with Proofs! (YAY!)

HW:

Add to your glossary:
- the 2 new Theorems from 2.6
- the 3 strategies listed under "Using the Multiplication and Division Properties in Proofs"

p. 87-88 # 6, 9, 14, 17

Quiz on 2.4 - 2.6 in two classes

2.5 - Addition and Subtraction Properties

Directions: Draw a Picture for each theorem below

Theorems

8) If a segment is added to two congruent segments, the sums are congruent (Addition Property)

9) If an angle is added to two congruent angles, the sums are congruent (Addition Property)

10) If congruent segments are added to congruent segments, the sums are congruent.

11) If congruent angles are added to congruent angles, the sums are congruent.

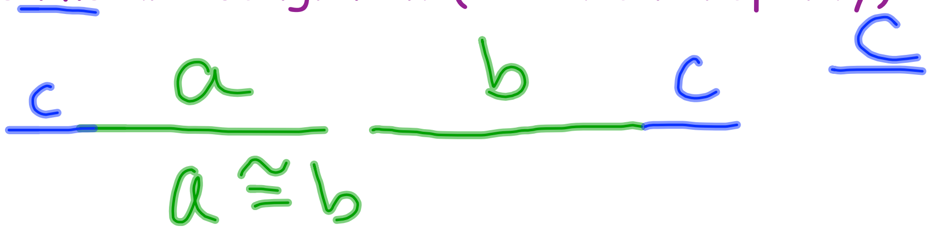
12) If a segment (or angle) is subtracted from congruent segments (or angles), the differences are congruent. SUBTRACTION PROPERTY

13) If congruent segments (or angles) are subtracted from congruent segments (or angles) the differences are congruent.)
SUBTRACTION PROPERTY

2.5- Addition and Subtraction

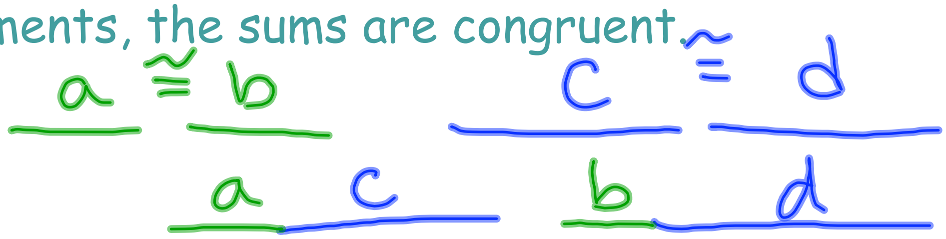
Theorems: (include a picture...)

8) If a segment is added to two congruent segments, the sums are congruent (Addition Property)

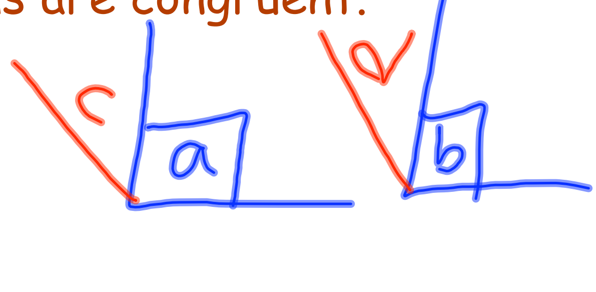


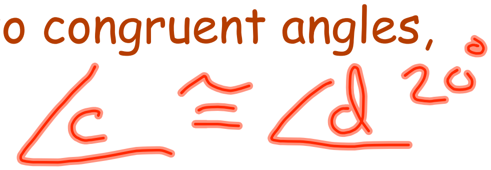
9) If an angle is added to two congruent angles, the sums are congruent (Addition Property)

10) If congruent segments are added to congruent segments, the sums are congruent.

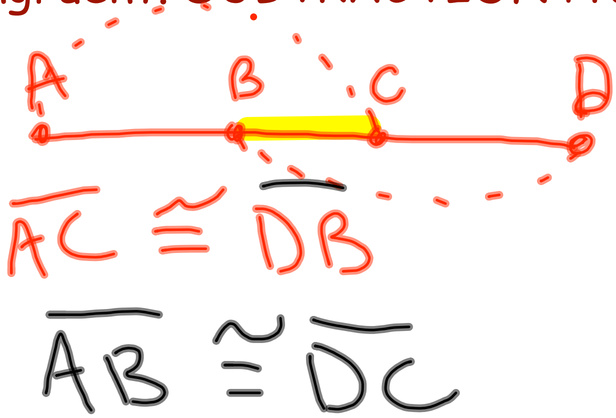


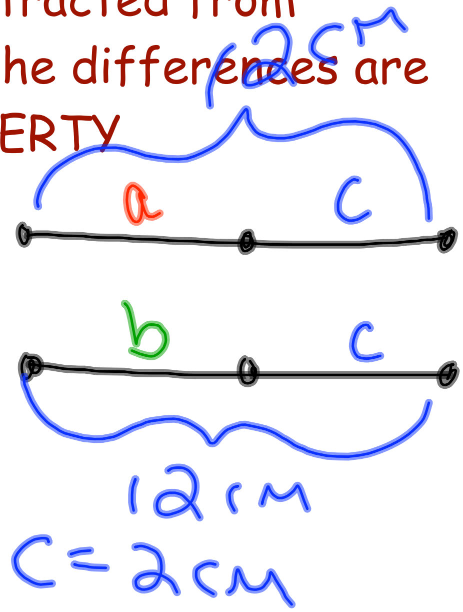
11) If congruent angles are added to congruent angles, the sums are congruent.



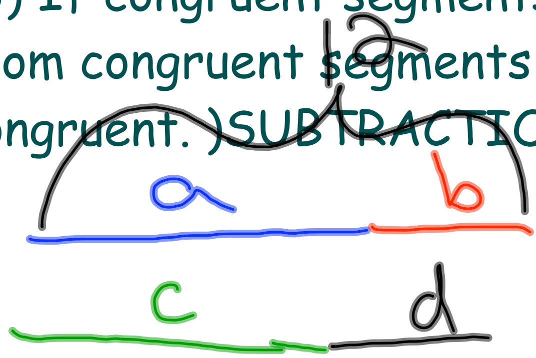


12) If a segment (or angle) is subtracted from congruent segments (or angles), the differences are congruent. SUBTRACTION PROPERTY

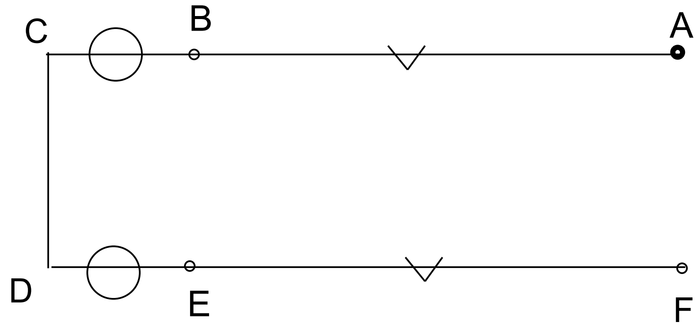




13) If congruent segments (or angles) are subtracted from congruent segments (or angles) the differences are congruent.)SUBTRACTION PROPERTY

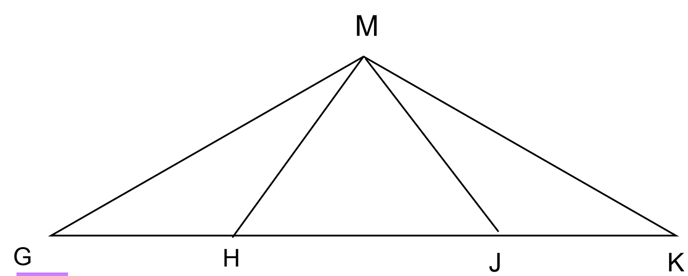


Applications of New Theorems



1) Given: $\overline{AB} \cong \overline{FE}$
$\overline{BC} \cong \overline{ED}$
Prove: $\overline{AC} \cong \overline{FD}$

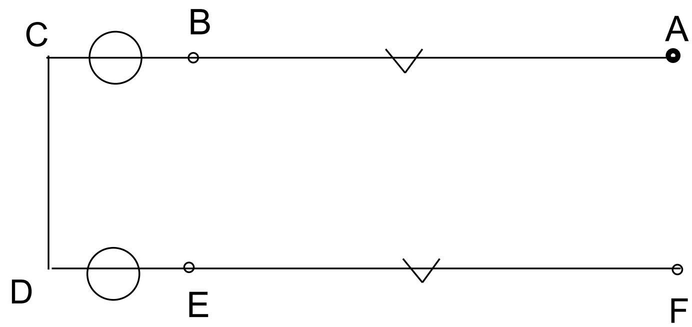
Statement	Reason
1) a. b.	1)
2) a. b.	2)
3)	3)



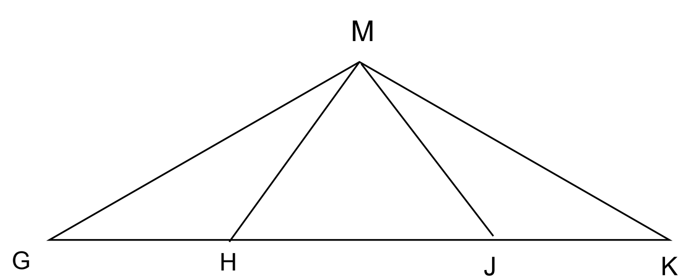
2) Given: $\overline{GH} \cong \overline{HK}$
Can you conclude $\overline{GH} \cong \overline{JK}$?
Based on which theorem?

Applications of New Theorems

1) Given: $\overline{AB} \cong \overline{FE}$
$\overline{BC} \cong \overline{ED}$
Prove: $\overline{AC} \cong \overline{FD}$



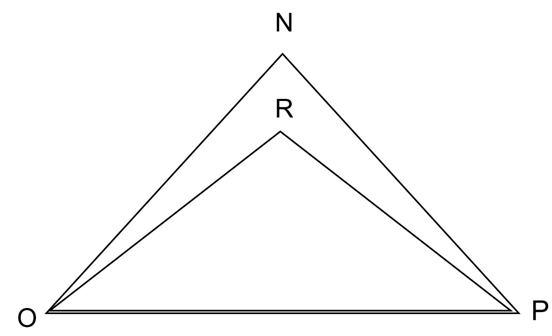
Statement	Reason
1) a. $\overline{AB} \cong \overline{FE}$ b. $\overline{BC} \cong \overline{ED}$	1) Given
2) a. $\overline{AB} + \overline{BC} = \overline{AC}$ b. $\overline{FE} + \overline{ED} = \overline{FD}$	2) Segment Addition
3) $\overline{AC} \cong \overline{FD}$	3) If ≅ segments are added to ≅ segments, then their sums are ≅



2) Given: $\overline{GH} \cong \overline{HK}$
Can you conclude $\overline{GH} \cong \overline{JK}$? Yes!
Based on which theorem?

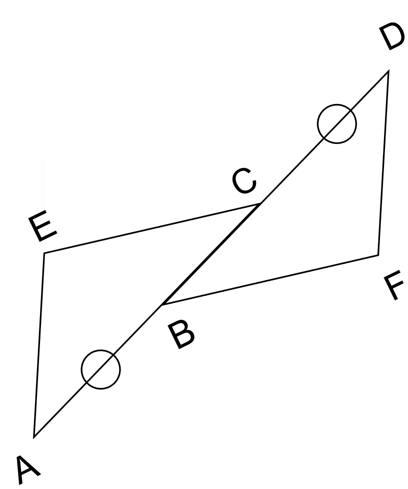
If a segment ($\overline{HJ}$) is subtracted from ≅ segments, the differences are ≅.
(Subtraction property)

3) Given: $\angle NOP \cong \angle NPO$
$\angle ROP \cong \angle RPO$
Prove: $\angle NOR \cong \angle NPR$

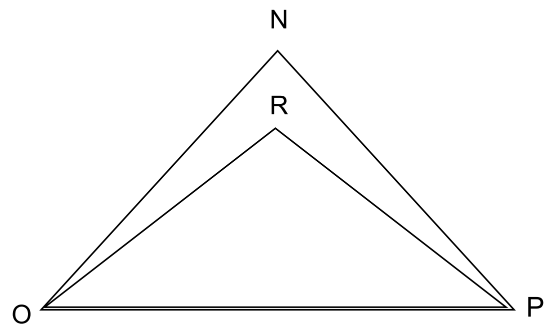


Statement	Reason
1) a. b.	1)
2) a. b.	2)
3)	3)

4) Given: $\overline{AB} \cong \overline{CD}$
What can you conclude?
Based on which theorem?



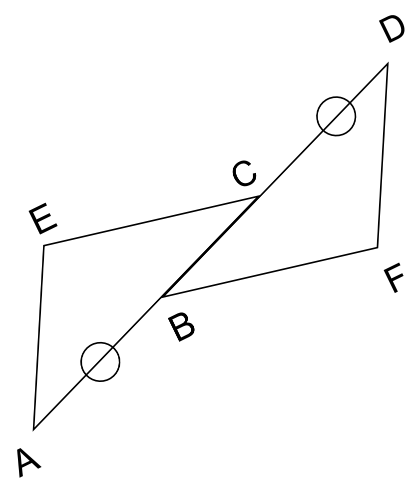
3) Given: $\angle NOP \cong \angle NPO$
$\angle ROP \cong \angle RPO$
Prove: $\angle NOR \cong \angle NPR$



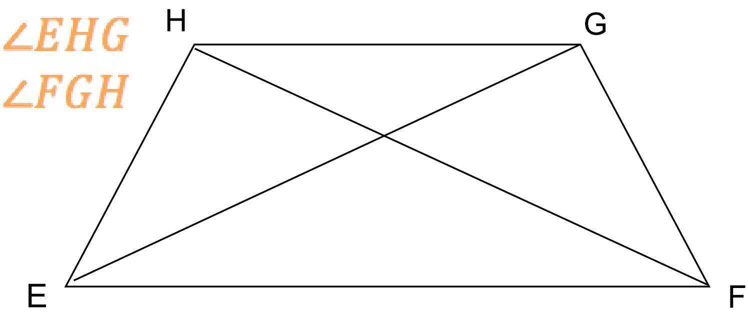
Statement	Reason
1) a. $\angle NOP \cong \angle NPO$ b. $\angle ROP \cong \angle RPO$	1) Given
2) a. $\angle NOP - \angle ROP = \angle NOR$ b. $\angle NPO - \angle RPO = \angle NPR$	2) Angle subtraction
3) $\angle NOR \cong \angle NPR$	3) If $\cong$ angles are subtracted from $\cong$ angles, then their differences are $\cong$

4) Given: $\overline{AB} \cong \overline{CD}$
What can you conclude? $\overline{AC} \cong \overline{BD}$
Based on which theorem?

If a segment ($\overline{BC}$) is added to $\cong$ segments, then the sums are $\cong$.

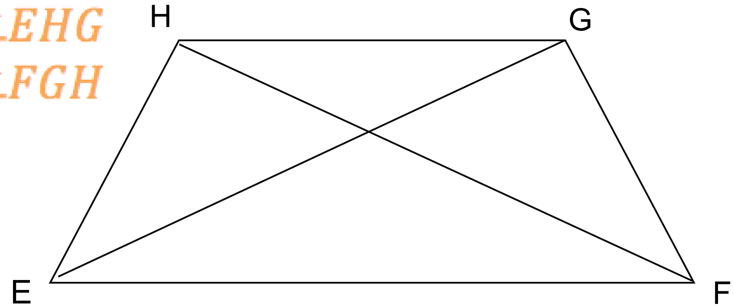


5) Given: $\angle HEF$ is supp. to $\angle EHG$
$\angle GFE$ is supp. to $\angle FGH$
$\angle EHF \cong \angle FGE$
$\angle GHF \cong \angle HGE$
Prove: $\angle HEF \cong \angle GFE$



Statement	Reason
1) a. b. c. d.	1)
2) a. b.	2)
3)	3)
4)	4)

5) Given: $\angle HEF$ is supp. to $\angle EHG$
$\angle GFE$ is supp. to $\angle FGH$
$\angle EHF \cong \angle FGE$
$\angle GHF \cong \angle HGE$
Prove: $\angle HEF \cong \angle GFE$



Statement	Reason
1) a. $\angle HEF$ is supp. to $\angle EHG$ b. $\angle GFE$ is supp. to $\angle FGH$ c. $\angle EHF \cong \angle FGE$ d. $\angle GHF \cong \angle HGE$	1) Given
2) a. $\angle EHF + \angle GHF = \angle EHG$ b. $\angle FGE + \angle HGE = \angle FGH$	2) Angle addition (Step 1 c & d)
3) $\angle EHG \cong \angle FGH$	3) If ≅ angles are added to ≅ angles, then their sums are ≅ (Step 2)
4) $\angle HEF \cong \angle GFE$	4) Supplements of ≅ ∠s are ≅ (Step 1 a & b with 3)