Name: Key

Proofs for Triangle Congruence - NOTES

We will use:

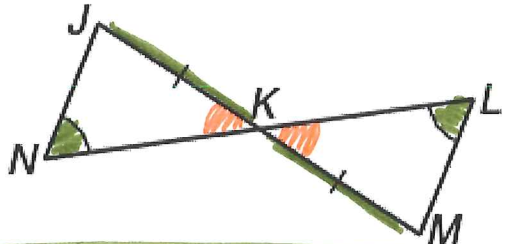
SSS - Side, Side, Side — ASA - Angle, Side, Angle
HL - Hypotenuse, Leg — AAS- Angle Angle Side
SAS- Side, Angle, Side — as postulates to prove congruent triangles.

CPCTC= Corresponding Parts of Congruent Triangles are Congruent.

When writing a proof you must:
1.) start by Given
2.) write what we can conclude from the Given THEN the picture.
3.) end w/ what we wanted to Prove but never use "Prove" as a reason.

1.)

Given: $\angle N \cong \angle L$
$\overline{JK} \cong \overline{MK}$
Prove: $\triangle JKN \cong \triangle MKL$

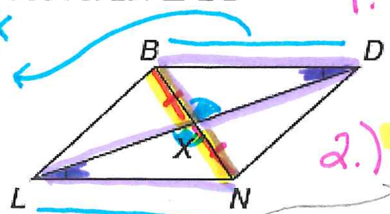


1. $\angle N \cong \angle L$ $JK \cong MK$	1. given
2. $\angle JKN \cong \angle MKL$	2. vertical $\angle$s are $\cong$
3. $\triangle JKN \cong \triangle MKL$	3. AAS

2.)

Given: $\overline{DL}$ bisects $\overline{BN}$.
$\angle XLN \cong \angle XDB$
Prove: $\overline{LN} \cong \overline{DB}$

want $\cong$



info from given

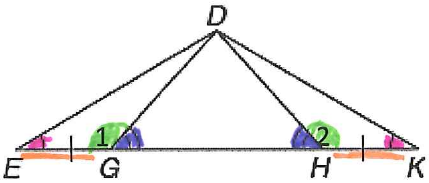
1. DL Bisects BN $\angle XLN \cong \angle XDB$	1. given
2.) $BX \cong NX$	2.) def of bisector
3. $\angle BXD \cong \angle NXL$	3. vertical $\angle$s are $\cong$
4.) $\triangle NXL \cong \triangle BXD$	4. AAS
5. $LN \cong DB$	5. CPCTC (corresponding parts of $\cong$ $\triangle$ are $\cong$)

This means that after we us a shortcut to Prove $\cong$ $\triangle$, we know all other parts are $\cong$ too!

3.)

Given: $\angle E \cong \angle K$, $\angle DGH \cong \angle DHG$
$\overline{EG} \cong \overline{KH}$

Prove: $\triangle EGD \cong \triangle KHD$



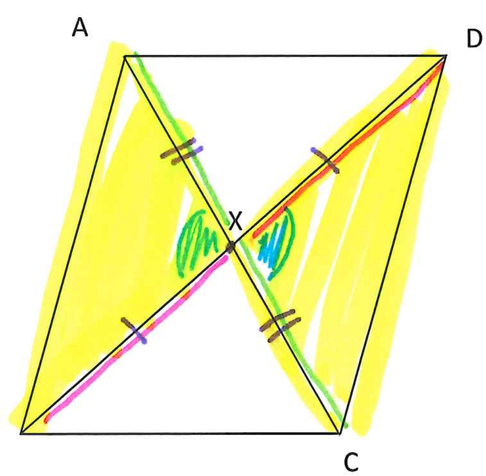
Want to get $\angle 1 \cong \angle 2$ because then we can use ASA to show $\cong$ Δs.

1. $\angle E \cong \angle K$ $\angle DGH \cong \angle DHG$ $EG \cong KH$	1. given
2. $\angle DGH + \angle 1 = 180$ $\angle DHG + \angle 2 = 180$	2. linear pairs are Suppl.
3. $\angle DGH + \angle 1 = \angle DHG + \angle 2$	3. Substitution
4. $\angle DGH + \angle 1 = \angle DGH + \angle 2$ $-\angle DGH \quad -\angle DGH$	4. Substitution
5. $\angle 1 \cong \angle 2$	5. Subtraction
6. $\triangle EGD \cong \triangle KHD$	6. ASA

4.)

Given: x is the midpoint of BD
x is the midpoint of AC

Prove: ΔDXC is congruent to ΔBXA

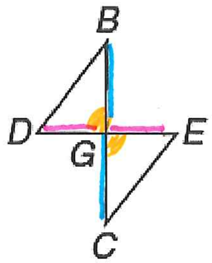


1. X is midpt of BD X is midpt of AC	1. Given
2. $BX \cong DX$ $AX \cong CX$	2. Definition of midpoint
3. $\angle AXB \cong \angle CXD$	3. Vertical $\angle$s are $\cong$
4. ΔDXC is congruent to ΔBXA	4. SAS

5.)

Given: $\overline{DE}$ and $\overline{BC}$ bisect each other.

Prove: $\triangle DGB \cong \triangle EGC$



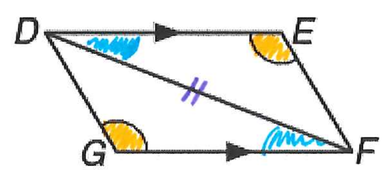
1. DE and BC bisect each other.	1. given
2. $BG \cong CG$ $DG \cong EG$	2. def of bisector
3. $\angle BGD \cong \angle CGE$	3. vertical $\angle$s are $\cong$
4. $\triangle DGB \cong \triangle EGC$	4. SAS

6.)

Given: $\overline{DE} \parallel \overline{FG}$

$\angle E \cong \angle G$

Prove: $\triangle DFG \cong \triangle FDE$



1. $DE \parallel FG$ — 1. Given

   $\angle E \cong \angle G$

2. $\angle EDF \cong \angle GFD$ — 2. Parallel lines form $\cong$ alternate interior angles

3. $DF \cong DF$ — 3. Reflexive

4. $\triangle DFG \cong \triangle FDE$ — 4. AAS

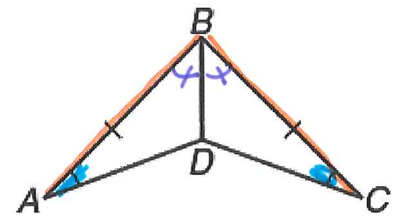
7.)

Given: $\overline{AB} \cong \overline{CB}$

$\angle A \cong \angle C$

$\overline{DB}$ bisects $\angle ABC$.

Prove: $\overline{AD} \cong \overline{CD}$



1. AB ≅ CB ∠A ≅ ∠C DB bisects ∠ABC	1. given
2. ∠ABD ≅ ∠CBD	2. def of angle bisector.
3. △ABD ≅ △CBD	3. ASA
4. AD ≅ CD	4. cpctc

If you prove ≅ △
then the left over
Parts are ≅ to each other

Name: ______________________

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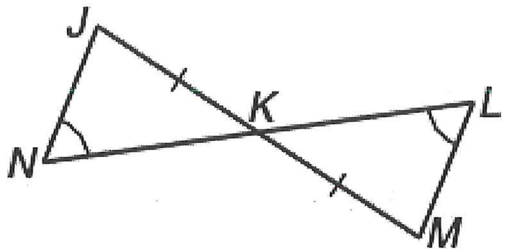

When writing a proof you must:

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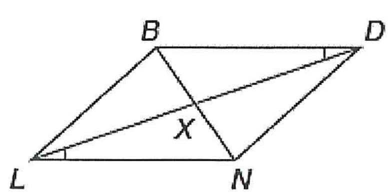

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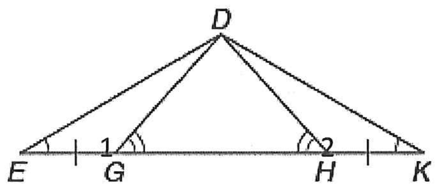

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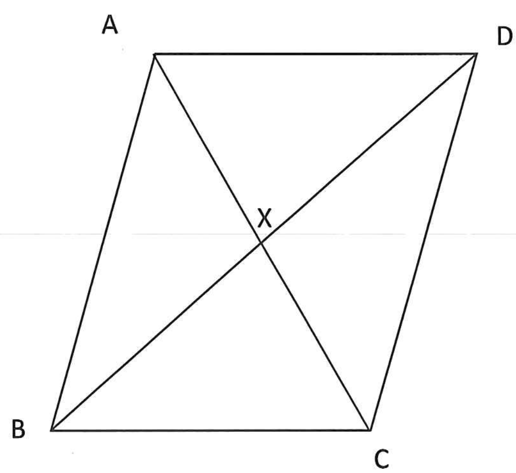
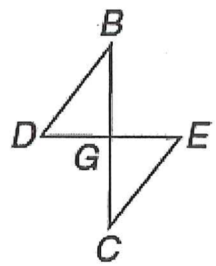


1.______________________________	1. Given
______________________________	
2. ______________________________	2. Definition of midpoint
______________________________	
3. ______________________________	3. ______________________________
4. ΔDXC is congruent to ΔBXA	4. ____________________

5. Given: $\overline{DE}$ and $\overline{BC}$ bisect each other.

Prove: $\triangle DGB \cong \triangle EGC$



6. **Given:** $\overline{DE} \parallel \overline{FG}$

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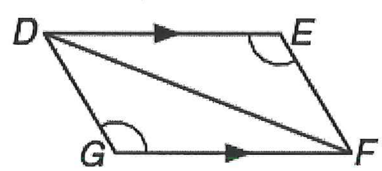
Prove: $\triangle DFG \cong \triangle FDE$



1. ____________________ 1. Given

____

2. ____________________ 2. Parallel lines form ≅ alternate interior angles

3. $DF \cong DF$ 3. Reflexive

4. ____________________ 4. ____________________

7. **Given:** $\overline{AB} \cong \overline{CB}$

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$\overline{DB}$ bisects $\angle ABC$.

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