Key

Acc Geometry-

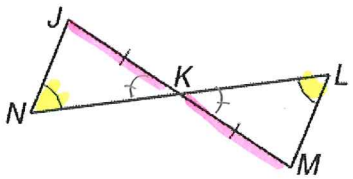
Proofs for Triangle Congruence- NOTES

We will use SSS- Side, Side, Side, ASA-Angle, side, angle HL-Hypotenuse, Leg and SAS- Side, angle, side as postulates to prove congruent triangles.

CPCTC= Congruent Parts of Congruent Triangles are Congruent.

Prove: SAA

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

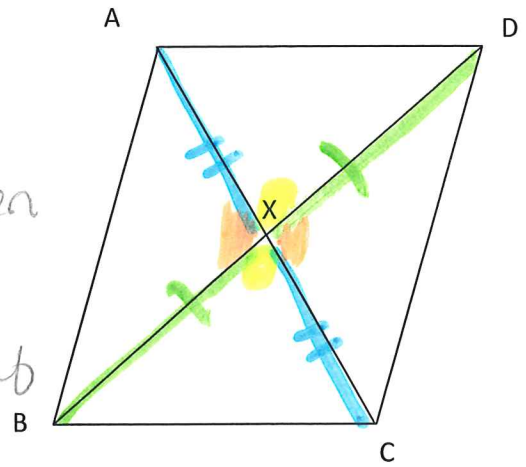


1. $\angle N \cong \angle L$, $JK \cong MK$	1. Given
2. $\angle JKN \cong \angle MKL$	2. Vertical $\angle$s are $\cong$
3. $\triangle JKN \cong \triangle MKL$	3. AAS

Using Congruent Triangles in Proof

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

Prove: △DXC is congruent to △BXA



1. X is midpt of BD
X is midpt of AC — 1. Given

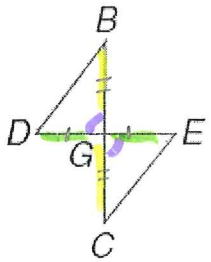
2. AX = XC
BX ≅ XD — 2. def of midpt

3. ∠AXB ≅ ∠CXD — 3. Vertical ∠s are ≅

4. △DXC is ≅ to △BXA — 4. SAS

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

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



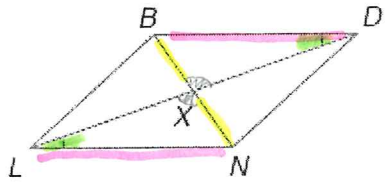
1. DE and BC bisect — 1. given

2. BG ≅ GC
DG ≅ EG — 2. def of seg. bisector

3. ∠BGD ≅ ∠CGE — 3. Vertical ∠s are ≅

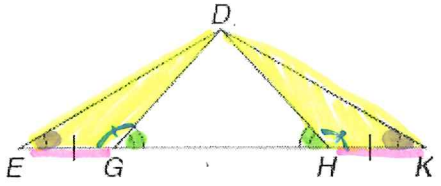
4. △DGB ≅ △EGC — 4. SAS

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



1. DL Bisects BN $\angle XLN \cong \angle XDB$	1. Given
2. $BX \cong XN$	2. def of bisector
3. $\angle BXD \cong \angle NXL$	3. Vertical $\angle$s are $\cong$
4. $\triangle XDB \cong \triangle XLN$	4. AAS
5. $LN \cong DB$	5. Cpctc Corresp. parts of $\cong \triangle$ are $\cong$

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

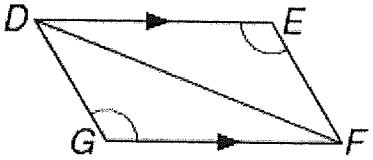


1. $\angle E \cong \angle K$, $\angle DGH \cong \angle DHG$ $EG \cong KH$	1. given
2. $\angle EGD + \angle DGH = 180$ $\angle DHG + \angle DHK = 180$	2. linear pairs are suppl.
3. $\angle EGD + \angle DGH = \angle DHG + \angle DHK$	3. Subst.
4. $\angle EGD + \angle DGH = \angle DGH + \angle DHK$	4. Subst.
5. $\angle EGD \cong \angle DGH$	5. Subtraction
6. $\triangle EGD \cong \triangle KHD$	6. ASA

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

$\angle E \cong \angle G$

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



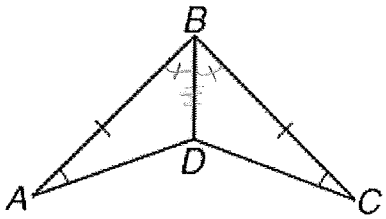
1. DE // FG, ∠E ≅ ∠G	1. given
2. ∠EDF ≅ ∠GFD	2. // lines form ≅ alt int ∠s
3. DF ≅ DF	3. Reflexive
4. △DFG ≅ △FDE	4. AAS

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

$\angle A \cong \angle C$

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

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



1. $\overline{AB} \cong \overline{CB}$, ∠A ≅ ∠C, DB bisects ∠ABC	1. given
2. ∠ABD ≅ ∠CBD	2. def of ∠ bisector
3. △ABD ≅ △CBD	3. ASA
OR 3.5 BD ≅ BD	3.5 reflexive } must state reflexive if AAS or SAS.
3.75 △ABD ≅ △CBD	3.75 SAS or AAS }
4. AD ≅ CD	4. CPCTC