

Congruence Proofs

Steps:

- ① Mark the given information on both your triangles
[congruence tick marks]
- ② Determine what else is needed to prove triangles are congruent.
[ASA, SAS, SSS, HL, AAS]
- ③ If needed, use CPCTC to prove parts of congruent triangles are congruent.

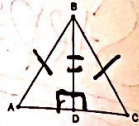
Notes:

- Reflexive prop: share the same side; so \cong
- Midpt - splits line into two equal parts

Congruence Proofs

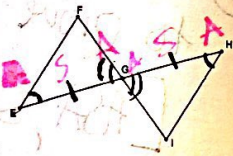
Triangle Congruence Proofs

Ex 1) Given: $\overline{AC} \perp \overline{BD}$
 $\overline{AB} \cong \overline{BC}$
 Prove: $\triangle ABD \cong \triangle CBD$



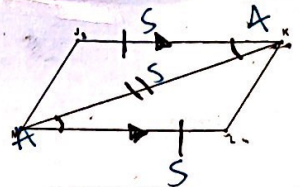
Given	Given	Reflexive Property	Statements	Justifications
$\overline{AC} \perp \overline{BD}$	$\overline{AB} \cong \overline{BC}$	$\overline{BD} \cong \overline{BD}$	$\overline{AC} \perp \overline{BD}$	Given
def of \perp			$\overline{AB} \cong \overline{BC}$	Given
$\angle ADB \cong \angle CDB$			$\overline{BD} \cong \overline{BD}$	Reflexive
def of \perp			$\angle ADB \cong \angle CDB$	def of \perp
$\angle ADB \cong \angle CDB$			$\angle ADB \cong \angle CDB$	def of \perp
			$\triangle ABD \cong \triangle CBD$	by HL

Ex 2) Given: G is the midpoint of \overline{EH}
 $\angle E \cong \angle H$
 Prove: $\angle F \cong \angle I$



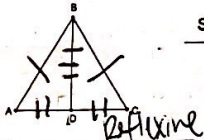
Given	Given	Vertical	Statements	Justifications
G is the midpt of \overline{EH}	$\angle E \cong \angle H$	$\angle FGE \cong \angle IGH$	$\overline{EG} \cong \overline{GH}$	def of midpt
def of midpt			$\triangle EGF \cong \triangle HGI$	by ASA
			$\angle F \cong \angle I$	CPCTC

Ex 3) Given: $\overline{JK} \parallel \overline{ML}$
 $\overline{JK} \cong \overline{ML}$
 Prove: $\angle J \cong \angle L$



Given	Given	Reflexive Property	Statements	Justifications
$\overline{JK} \parallel \overline{ML}$	$\overline{JK} \cong \overline{ML}$	$\overline{JM} \cong \overline{JM}$	$\angle MKL \cong \angle KJM$	by SAS
Alt Int \angle			$\angle MKL \cong \angle KJM$	CPCTC
			$\angle J \cong \angle L$	

Ex 4) Given: D is the midpoint of \overline{AC}
 $\overline{AB} \cong \overline{BC}$
 Prove: $\angle A \cong \angle C$

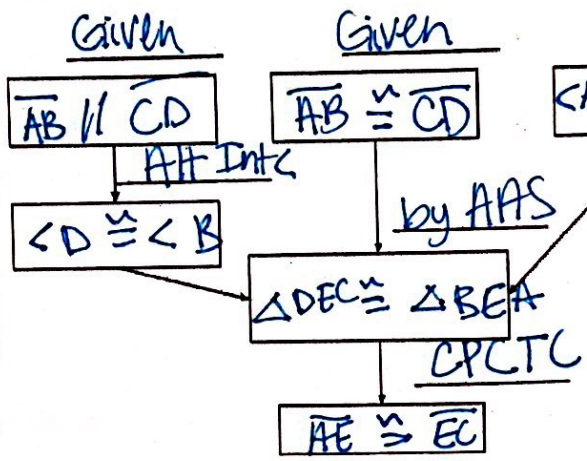
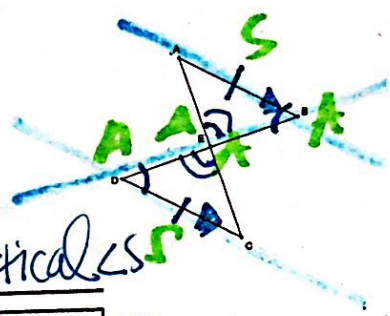


Given	Given	Reflexive	Statements	Justifications
D is the midpt of \overline{AC}	$\overline{AB} \cong \overline{BC}$	$\overline{BD} \cong \overline{BD}$	$\overline{AD} \cong \overline{DC}$	def of midpt
def of midpt			$\triangle ADB \cong \triangle CDB$	SSS
			$\angle A \cong \angle C$	CPCTC

Start with (proof)

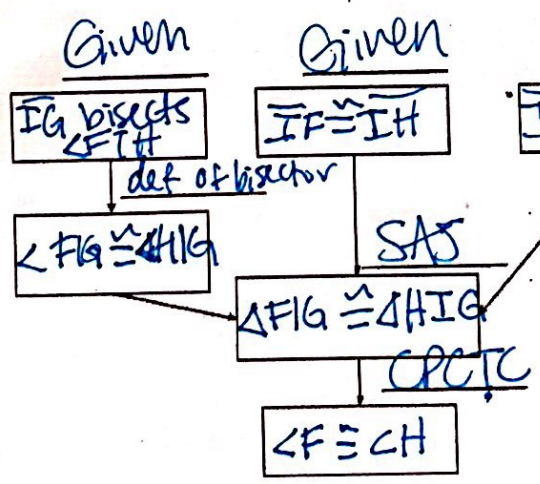
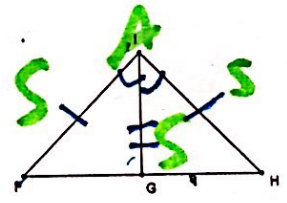
Warm-up

Ex 5) Given: $\overline{AB} \parallel \overline{CD} \rightarrow$ Alt Int \angle
 $\overline{AB} \cong \overline{CD}$
 Prove: $\overline{AE} \cong \overline{EC}$



Statements	Justifications
$\angle AEB \cong \angle DEC$	Vertical \angle s
$\triangle DEC \cong \triangle BEA$	AAS
$\overline{AE} \cong \overline{EC}$	CPCTC

Ex 6) Given: \overline{IG} bisects $\angle FGH$
 $\overline{IF} \cong \overline{IH}$
 Prove: $\angle F \cong \angle H$



Statements	Justifications
$\overline{IG} \cong \overline{IG}$	Reflexive
$\triangle FIG \cong \triangle HIG$	SAS
$\angle F \cong \angle H$	CPCTC

Transformations

Quadratic Functions

Quadratic Functions

Radical Functions

Congruence & Similarity

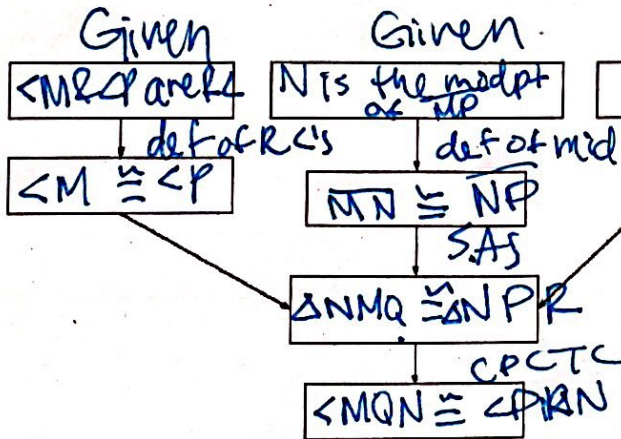
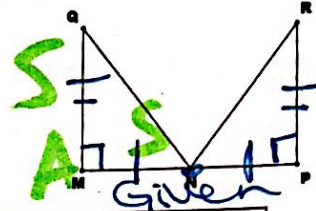
MORE PROOFS.

Congruence Proofs- Practice

Ex 1) Given: $\angle M$ and $\angle P$ are right angles.

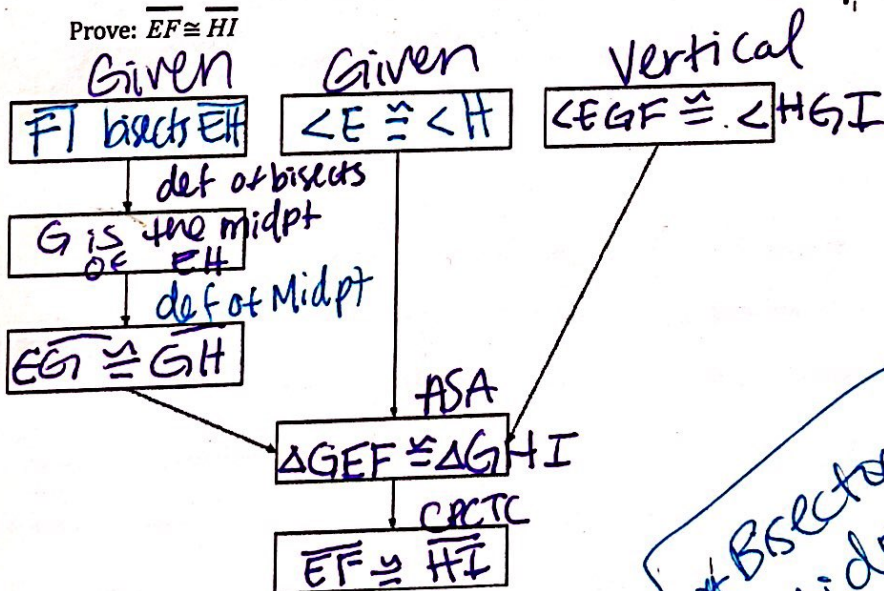
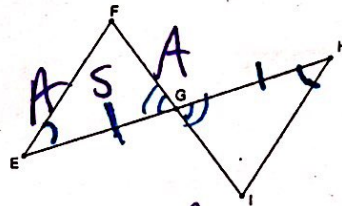
N is the midpoint of \overline{MP} , $\overline{MQ} \cong \overline{PR}$,

Prove: $\angle MQN \cong \angle PRN$



Ex 2) Given: \overline{FI} bisects \overline{EH}
 $\angle E \cong \angle H$

Prove: $\overline{EF} \cong \overline{HI}$



* Bisector & Midpoint splits on half on