Key

Math 1

Name (Key)

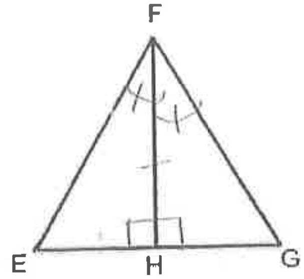
Date ________

6-7 :Triangle Proofs

1. Given: $\overline{HF}$ bisects $\angle EFG$

$\overline{HF} \perp \overline{EG}$

Prove: $\Delta EHF \cong \Delta GHF$

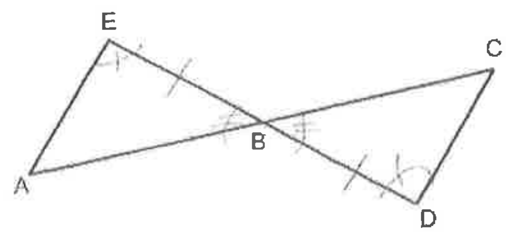


Statement	Reason
(1) HF bisects ∠EFG	(1.) given
(2) ∠EFH ≅ HFG	(2) angle bisector
(3) $\overline{HF}$ ⊥ EG	(3) given
(4) ∠EHF ≅ FHG = 90°	(4) perpendicular lines
(5) $\overline{FH}$ ≅ $\overline{FH}$	(5) ~~shared~~ side Reflexive Property
(6) ΔEHF ≅ ΔGHF	(6) ASA

2. Given: B is the midpoint of $\overline{ED}$

$\overline{AE} \parallel \overline{CD}$

Prove: $\Delta BAE \cong \Delta BCD$

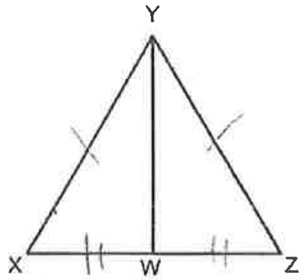


Statement	Reason
(1) B is midpt of ED	(1) given
(2) $\overline{EB}$ ≅ $\overline{BD}$	(2) def of midpoint
(3) $\overline{AE}$ ∥ $\overline{CD}$	(3) given
(4) ∠AEB ≅ ∠BDC	(4) alt. int. angles
(5) ∠EBA ≅ ∠CBD	(5) vertical angles
(6) ΔAEB ≅ ΔCBD	(6) SAS

3. Given: $\overline{XY} \cong \overline{YZ}$

$\overline{YW}$ is the median to $\overline{XZ}$

Prove: $\Delta XYW \cong \Delta ZYW$

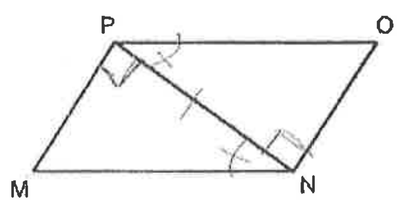


Statement	Reason
(1) $\overline{XY} \cong YZ$	(1) given
(2) $\overline{YW}$ is med to $\overline{XZ}$	(2) given
(3) $\overline{XW} \cong \overline{WZ}$	(3) def of median
(4) $\overline{WY} \cong \overline{WY}$	(4) ~~shared side~~ Reflexive Property
(5) $\Delta XYW \cong \Delta ZYW$	(5) SSS

4. Given: $\overline{NP} \perp \overline{MP}$

$\overline{PN} \perp \overline{ON}$

$\angle OPN \cong \angle MNP$



Prove: $\Delta MPN \cong \Delta ONP$

Statement	Reason
(1) $\overline{NP} \perp \overline{MP}$ / $\overline{PN} \perp \overline{ON}$	(1) given
(2) $\angle MPN \cong \angle PNO = 90°$	(2) perpendicular angles
(3) $\angle OPN \cong \angle MNP$	(3) given
(4) $\overline{PN} \cong PN$	(4) ~~shared side~~ Reflexive Property
(5) $\Delta MPN \cong \Delta ONP$	(5) ASA

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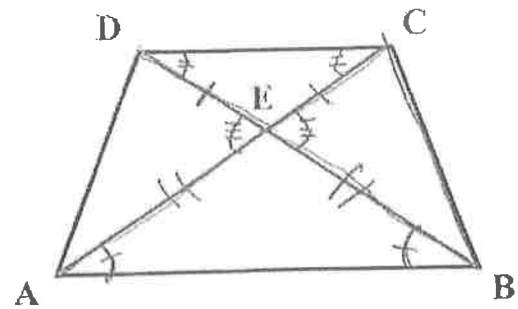
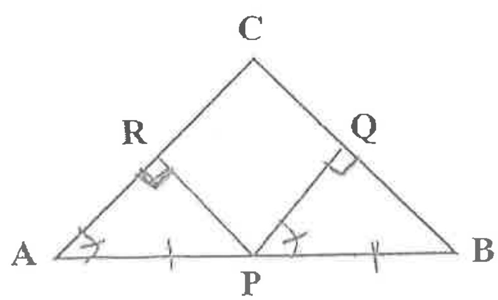
1. Given: $\angle EAB \cong \angle EBA$
$\angle EDC \cong \angle ECD$



Prove: $\Delta ADE \cong \Delta BCE$

Statement	Reason
1) $\angle EAB \cong \angle EBA$ + $\angle EDC \cong \angle ECD$	1) Given
2) $\angle DEA \cong \angle CEB$	2) Vertical Angles
3) $\overline{DE} \cong \overline{CE}$	3) Def of isosceles triangle
4) $\overline{AE} \cong \overline{BE}$	4) Same as 3)
5) $\Delta ADE \cong \Delta BCE$	5) SAS

2. Given: $\overline{PR} \perp \overline{CA}$
$\overline{BQ} \perp \overline{QP}$
P is the midpoint to $\overline{AB}$
$\angle RAP \cong \angle QPB$



Prove: $\Delta ARP \cong \Delta PQB$

Statement	Reason
1) $\overline{PR} \perp \overline{CA}$, $\overline{BQ} \perp \overline{QP}$, P is midpt, $\angle RAP \cong \angle QPB$	1) Given
2) $m\angle ARP = m\angle PQB = 90°$	2) Def. of perpendicular
3) $\overline{AP} \cong \overline{BP}$	3) Def of midpoint
4) $\Delta ARP \cong \Delta PQB$	4) AAS

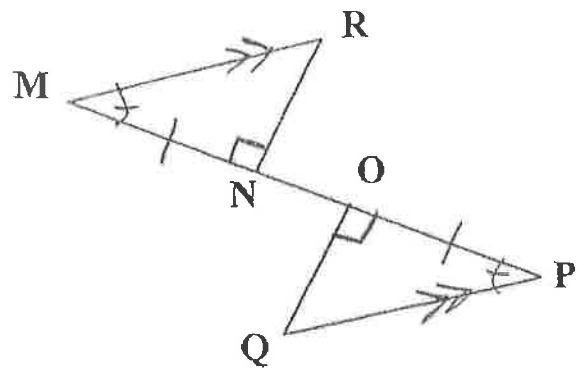
3. Given: $\overline{MN} \cong \overline{PO}$

$\overline{RN} \perp \overline{MP}$

$\overline{QO} \perp \overline{MP}$

$\overline{MR} \parallel \overline{PQ}$

Prove: $\Delta QOP \cong \Delta RNM$

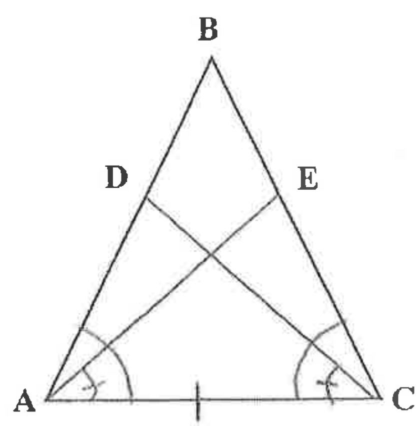


Statement	Reason
1) $\overline{MN} \cong \overline{PO}$, $\overline{RN} \perp \overline{MP}$, $\overline{QO} \perp \overline{MP}$, $\overline{MR} \parallel \overline{PQ}$	1) Given
2) $m\angle MNR = m\angle QOP = 90°$	2) Definition of perpendicular
3) $\angle M \cong \angle P$	3) Alternate Interior Angles
4) $\Delta QOP \cong \Delta RNM$	4) ASA

4. Given: $\overline{AB} \cong \overline{BC}$

$\angle EAC \cong \angle DCA$

Prove: $\Delta ADC \cong \Delta CEA$



Statement	Reason
1) $\overline{AB} \cong \overline{BC}$, $\angle EAC \cong \angle DCA$	1) Given
2) $\overline{AC} \cong \overline{AC}$	2) Shared side (reflexive property)
3) $\angle BAC \cong \angle BCA$	3) Def of isosceles triangle
4) $\Delta ADC \cong \Delta CEA$	4) ASA

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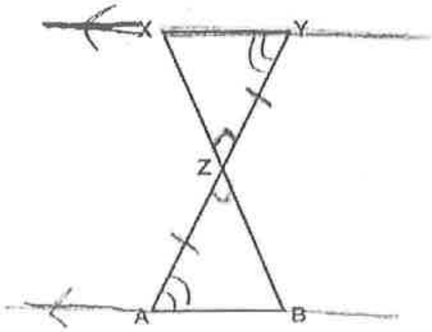
1. Given: $\overline{XY} \parallel \overline{AB}$
   Z is the midpoint of $\overline{AY}$

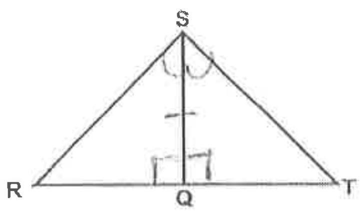
   Prove: $\triangle XYZ \cong \triangle BAZ$



Statements	Reasons
1.) $\overline{XY} \parallel \overline{AB}$	GIVEN
2.) Z is the midpoint of $\overline{AY}$	GIVEN
3.) $\overline{AZ} \cong \overline{ZY}$	Def. of midpoint
4.) $\angle XZY \cong \angle BZA$	Vertical Angle thm.
5.) $\angle XYZ \cong \angle BAZ$	Alternate Interior Angle
6.) $\triangle XYZ \cong \triangle BAZ$	ASA

2. Given: $\overline{SQ} \perp \overline{RT}$
   $\overline{QS}$ bisects $\angle RST$

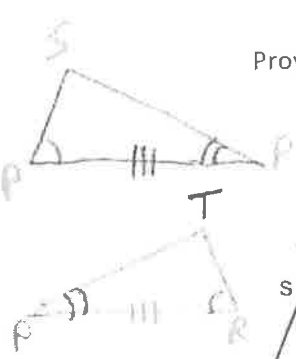
   Prove: $\triangle RSQ \cong \triangle TSQ$

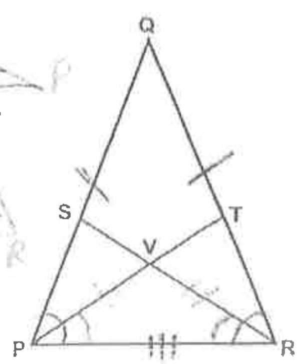


Statements	Reasons
1.) $\overline{SQ} \perp \overline{RT}$	GIVEN
2.) $\angle RQS \cong \angle TQS = 90°$	Def. of perpendicular
3.) $\overline{QS}$ bisects $\angle RST$	GIVEN
4.) $\angle RSQ = \angle TSQ$	Def. of bisector
5.) $\overline{SQ} \cong \overline{SQ}$	Reflexive Property
6.) $\triangle RSQ \cong \triangle TSQ$	ASA

3. Given: $\overline{PQ} \cong \overline{QR}$
   $\overline{PV} \cong \overline{VR}$

   Prove: $\triangle SRP \cong \triangle TPR$





Statements	Reasons
1.) $\overline{PQ} \cong \overline{QR}$	GIVEN
2.) $\angle QPR \cong \angle QRP$	Def. of Isosceles Triangles
3.) $\overline{PV} \cong \overline{VR}$	GIVEN
4.) $\angle VPR \cong \angle VRP$	Def. of Isosceles Triangles
5.) $\overline{PR} \cong \overline{PR}$	Reflexive Prop
6.) $\triangle SRP \cong \triangle TPR$	ASA