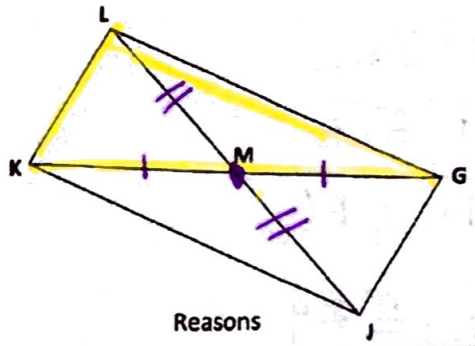
(H) Math3
Unit 5

Name:_____
Date:_____ Period:_____

Quadrilateral Proofs

1. Given: In ΔGKL, $\overline{LM}$ is a median. (midpt. → ≅segs)
$\overline{LM} \cong \overline{JM}$

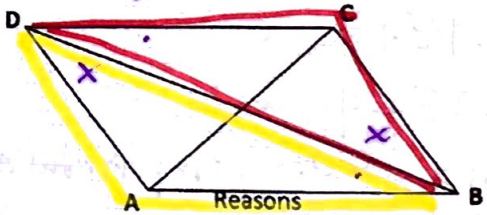
Prove: GJKL is a parallelogram



Statements	Reasons
1) ΔGKL, $\overline{LM}$ is median, $\overline{LM} \cong \overline{JM}$	1) Given
2) M is midpt. of $\overline{KG}$	2) Defn of median
3) M is midpt. of $\overline{JL}$	3) Defn of midpt.
4) $\overline{KG}$ and $\overline{JL}$ bisect each other	4) Defn of segment bisector
5) GJKL is a parallelogram	5) If diagonals of a quad. bisect each other, then it is a parallelogram.

2. Given: ΔABD ≅ ΔCDB

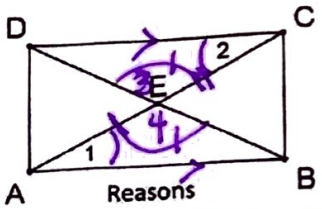
Prove: ABCD is a parallelogram



Statements	Reasons
1) ΔABD ≅ ΔCDB	1) Given
2) $\overline{DC} \cong \overline{BA}$, $\overline{DA} \cong \overline{BC}$	2) CPCTC
3) ABCD is parallelogram	3) If both pairs of opp. sides of quad. are ≅, then it is a parallelogram.

3. Given: $\angle 1 \cong \angle 2$
$\overline{AE} \cong \overline{CE}$

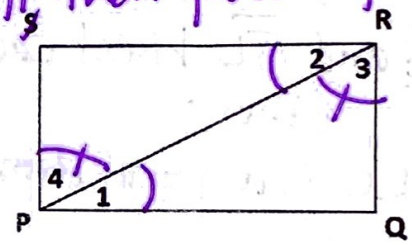
Prove: ABCD is a parallelogram



Statements	Reasons
1) $\angle 1 \cong \angle 2$, $\overline{AE} \cong \overline{CE}$	1) Given
2) $\overline{DC} \parallel \overline{BA}$	2) if $\angle$s are $\cong$ alt. int. $\angle$s, then lines are $\parallel$.
3) $\angle 3 \cong \angle 4$	3) if angles are vertical, then they are $\cong$.
4) $\triangle DCE \cong \triangle BAE$	4) ASA
5) $\overline{DC} \cong \overline{BA}$	5) CPCTC
6) ABCD is a parallelogram	6) if one pair of opp. sides is $\cong$ & $\parallel$, then quad. is parallelogram.

4. Given: $\angle 1 \cong \angle 2$
$\angle 3 \cong \angle 4$
$\angle 1$ and $\angle 4$ are complementary

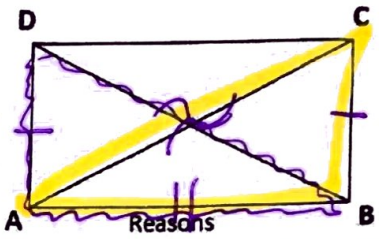
Prove: PQRS is a rectangle.



Statements	Reasons
1) $\angle 1 \cong \angle 2$ ✓ $\angle 3 \cong \angle 4$ ✓ $\angle 1$ & $\angle 4$ are complementary	1) Given
2) $\overline{SR} \parallel \overline{QP}$ $\overline{SP} \parallel \overline{QR}$	2) if alt. int. $\angle$s $\cong$, then lines $\parallel$.
3) PQRS is a parallelogram	3) if both pairs of opp. sides are $\parallel$, quad. is a parallelogram
4) $m\angle 1 + m\angle 4 = 90 = m\angle P$	4) Defn of complementary $\angle$s
5) $\angle P$ is a right $\angle$	5) Defn of right $\angle$
6) PQRS is a rectangle	6) if parallelogram has one right $\angle$, then it is a rectangle.

5. Given: ABCD is a rectangle

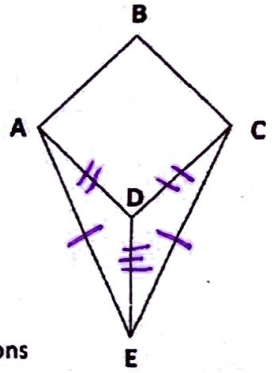
Prove: $\Delta DAB \cong \Delta CBA$



Statements	Reasons
1) ABCD is rectangle	1) Given
2) $\overline{DA} \cong \overline{BC}$	2) if quad. is rect., both pairs opp. sides $\cong$
3) $\overline{DB} \cong \overline{CA}$	3) if quad. is rect., then diagonals are $\cong$
4) $\overline{AB} \cong \overline{AB}$	4) Reflexive Property
5) $\Delta DAB \cong \Delta CBA$	5) SSS

6. Given: ABCD is a rhombus
$\overline{AE} \cong \overline{CE}$

Prove: $\angle ADE \cong \angle CDE$



Statements	Reasons
1) ABCD rhombus $\overline{AE} \cong \overline{CE}$	1) Given
2) $\overline{AD} \cong \overline{DC}$	2) if quad. is a rhombus, then all sides $\cong$.
3) $\overline{DE} \cong \overline{DE}$	3) Reflexive Property
4) $\Delta ADE \cong \Delta CDE$	4) SSS
5) $\angle ADE \cong \angle CDE$	5) CPCTC