

Name: Key

Date: _____

UNIT 4

LESSON 6

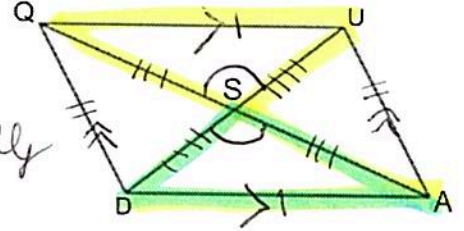
AIM: PARALLELOGRAM PROOFS (DAY 2)

PART I: USING PROPERTIES OF PARALLELOGRAMS TO PROVE TRIANGLES CONGRUENT

1. Given: QUAD is a parallelogram with diagonals \overline{QA} and \overline{DU} intersecting at S.

Prove: $\triangle QSU \cong \triangle ASD$

*There are many different ways to do this, I am going to do SAS
✓✓



STATEMENT

REASON

① QUAD is a \square with diagonals \overline{QA} and \overline{DU}

① Given

② $\overline{QS} \cong \overline{AS}$ ✓ ⑤
 $\overline{SU} \cong \overline{SD}$ ✓ ⑤

② Diagonals bisect each other in a \square

③ $\angle QSU \cong \angle ASD$ ✓ ④

③ vertical \angle 's are \cong

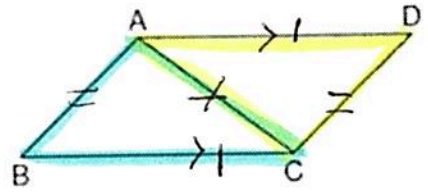
④ $\triangle QSU \cong \triangle ASD$

④ SAS \cong SAS

2. Given: Parallelogram ABCD with diagonal AC

Prove: $\triangle ABC \cong \triangle CDA$

* There are many ways to do this but I am going to do SSS!



STATEMENT	REASON
① $\square ABCD$ w/ diagonal AC	① Given
② $\overline{AD} \cong \overline{BC}$ (S) $\overline{AB} \cong \overline{CD}$ (S)	② Opp. sides are \cong in a \square
③ $\overline{AC} \cong \overline{AC}$	③ Reflexive Property
④ $\triangle ABC \cong \triangle CDA$	④ SSS \cong SSS

PART II: PROVING A QUADRILATERAL IS A PARALLELOGRAM USING CPCTC

3. Given: ABCD is a quadrilateral

$$\overline{AB} \parallel \overline{CD}$$

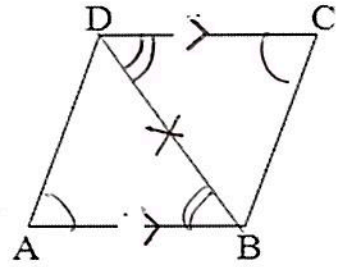
$$\angle A \cong \angle C$$

Prove: ABCD is a Parallelogram

Plan: ① $\triangle ABD \cong \triangle CDB$
by AAS

② $\therefore \overline{DC} \cong \overline{AB}$
by CPCTC

③ ABCD is a \square
b/c one pair of opp. sides are \cong and \parallel



STATEMENT

① ABCD is a quad.
 $\overline{AB} \parallel \overline{CD}$
 $\angle A \cong \angle C$

② $\angle CDB \cong \angle ABD$

③ $\overline{DB} \cong \overline{DB}$

④ $\triangle ABD \cong \triangle CDB$

⑤ $\overline{DC} \cong \overline{AB}$

⑥ quad ABCD is a \square

① Given

② Alt. int. \angle 's are \cong

③ Reflexive

④ AAS \cong AAS

⑤ CPCTC

⑥ One pair of opp. sides are \cong and \parallel

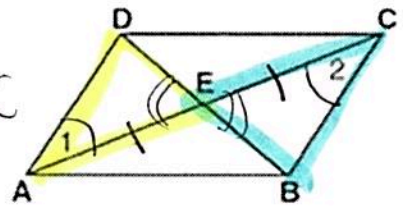
4. Given: \overline{DB} bisects \overline{AC}
 $\angle 1 \cong \angle 2$

Prove: $ABCD$ is a parallelogram

Plan: ① $\triangle ADE \cong \triangle CBE$
 by ASA

② $\overline{DE} \cong \overline{EB}$ by CPCTC

③ $ABCD$ is a \square b/c
 diagonals bisect
 each other



STATEMENT	REASON
① \overline{DB} bisects \overline{AC} $\angle 1 \cong \angle 2 \checkmark$ (A)	① Given
② $\overline{AE} \cong \overline{EC} \checkmark$ (S)	② A bisector creates 2 \cong segments
③ $\angle DEA \cong \angle BEC \checkmark$ (A)	③ vertical \angle 's are \cong
④ $\triangle ADE \cong \triangle CBE$	④ ASA \cong ASA
⑤ $\overline{DE} \cong \overline{EB}$	⑤ CPCTC
⑥ $ABCD$ is a \square	⑥ Diagonals bisect each other