

Objectives:

- I can construct a proof involving properties of a parallelogram and can use these properties to solve for a missing variable.

Flowchart of Quadrilaterals	Properties of Parallelograms
	<p>1. $\triangle ABC \cong \triangle ADC$</p> <p>2. opposite sides are \parallel.</p> <p>3. opposite angles are \cong</p> <p>4. diagonals bisect each other.</p>

Example Set: (Assume all are parallelograms)

<p>1. Find the measure of the numbered angles.</p> <p>$\angle 2 = 112^\circ$</p> <p>$\angle 1 \cong \angle 3$</p> <p>$180 - 112 = 68$</p> <p>$\angle 1 = \angle 3 = 68^\circ$</p>	<p>2. What value of t makes quadrilateral UVXW a parallelogram?</p> <p>$8t + 5 + 3t + 10 = 180$</p> <p>$11t + 15 = 180$</p> <p>$\frac{11t}{11} = \frac{165}{11}$ $t = 15$</p>	
<p>3. Solve for the values of a and b.</p> <p>$3b = 4b - 21$</p> <p>$-4b - 4b$</p> <p>$-b = -21$</p> <p>$b = 21$</p> <p>$3a = a + 78$</p> <p>$-a - a$</p> <p>$2a = 78$</p> <p>$\frac{2a}{2} = \frac{78}{2}$</p> <p>$a = 39$</p>	<p>4. What value of y makes PSRN a parallelogram?</p> <p>$20 = y + 14$</p> <p>$-14 - 14$</p> <p>$y = 6$</p>	<p>5. Solve for a.</p> <p>$2a = a + 5$</p> <p>$-a - a$</p> <p>$a = 5$</p>

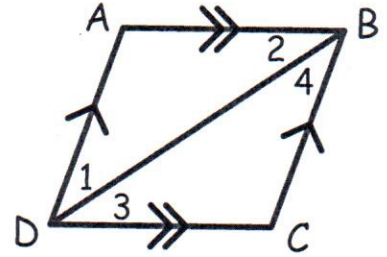
Can you name all of the theorems used to prove triangle congruence?

1. SSS 2. SAS 3. ASA 4. AAS 5. CPCTC

1. Given: ABCD is a parallelogram

Prove: $\triangle ABD \cong \triangle CDB$

Statement	Reason
① ABCD is a parallelogram	① Given
② $\overline{DB} \cong \overline{DB}$	② same side
③ $\angle 1 \cong \angle 4, \angle 2 \cong \angle 3$	③ AIA
④ $\triangle ABD \cong \triangle CDB$	④ ASA



2. Given: ABCD is a parallelogram

Prove: $\overline{AB} \cong \overline{DC}$ and $\overline{AD} \cong \overline{BC}$

statement	reason
① ABCD is a parallelogram	① given
② $\triangle ABD \cong \triangle CDB$	② previous proof
③ $\overline{AB} \cong \overline{DC}$ $\overline{AD} \cong \overline{BC}$	③ CPCTC

3. Given: ABCD is a parallelogram

Prove: $m\angle DAB \cong m\angle BCD$

statement	reason
① ABCD is a parallelogram	① given
② $\triangle ABD \cong \triangle CDB$	② previous proof
③ $m\angle DAB \cong m\angle BCD$	③ CPCTC