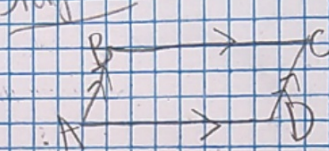


Given: Parallelogram ABCD
 Prove: Opposite sides are congruent
 Diagram



#1 ABCD is a parallelogram

$$\overline{AD} \parallel \overline{BC}$$

$$\overline{AB} \parallel \overline{DC}$$

\overline{BC} can be translated on top of \overline{AD}

$$\overline{BC} \cong \overline{AD}$$

\overline{AB} can be translated to \overline{DC}

$$\overline{AB} \cong \overline{CD}$$

Given

given - definition of parallelogram

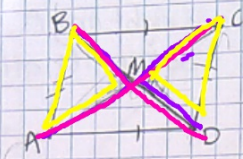
given - " " "

Translations

Translations

translations

translations



Statements

Parallelogram

$\overline{AD} \parallel \overline{BC}$

$\overline{AB} \parallel \overline{DC}$

$\angle BMA \cong \angle CMD$

$\angle BMC \cong \angle AMD$

$\overline{BM} \cong \overline{DM}$

$\overline{AM} \cong \overline{CM}$

$\triangle BAM \cong \triangle CDM$

$\triangle BCM \cong \triangle ADM$

$\overline{BA} \cong \overline{CD}$

$\overline{AD} \cong \overline{BC}$

Justifications

given
in definition

" "

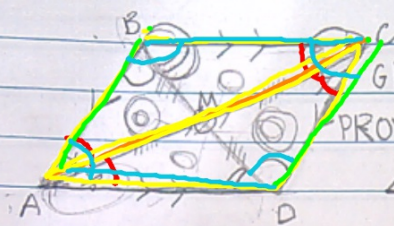
vertical angles
"

Straight line
"

$\overline{BA} \parallel \overline{CD}$

$\overline{BC} \parallel \overline{AD}$

Side



GIVEN: ABCD is a parallelogram
 PROVE: opposite ^{sides} angles are congruent
 $\angle A \cong \angle C, \angle B \cong \angle D$ / $\overline{AB} \cong \overline{DC}$
 $\overline{AD} \cong \overline{BC}$

STATEMENTS

ABCD is Parallelogram

$\overline{AD} \parallel \overline{BC}$

$\overline{AB} \parallel \overline{DC}$

$\angle BAC \cong \angle DCA$

$\angle CAD \cong \angle ACB$

$\overline{AC} \cong \overline{AC}$

$\triangle BAC \cong \triangle DCA$

$\overline{AB} \cong \overline{DC}$

$\overline{AD} \cong \overline{BC}$

$\angle A \cong \angle C$

$\angle B \cong \angle D$

JUSTIFICATIONS

GIVEN

Def. of parallelogram

" "

Alternate angles

" "

Reflexive property

ASA

← "Corresponding parts
 of congruent triangles"

↘

↘

given: ABCD is a parallelogram
parallelogram's definition: 2 sets of parallel lines
Prove, opposite angles are congruent

