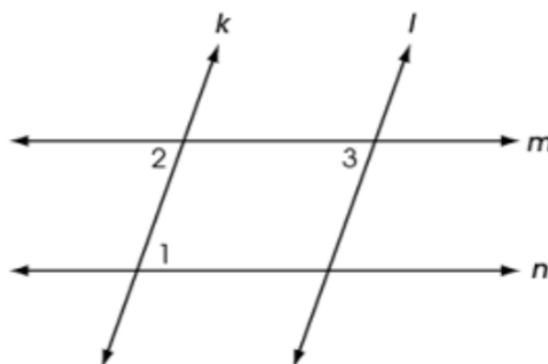


# Parallelogram

*Proof.*

**Problem 1** Adapted from Ohio's 2017 Geometry released item 13.

Two pairs of parallel lines intersect to form a parallelogram as shown.



Complete the following proof that opposite angles of a parallelogram are congruent:

- (a)  $\angle 1 \cong \angle 2$  as (opposite angles / alternate interior angles ✓ / corresponding angles) for parallel lines ( $m$  and  $n$  ✓ /  $k$  and  $l$ ).
- (b)  $\angle 3 \cong \angle 2$  as (opposite angles / alternate interior angles / corresponding angles ✓) for parallel lines ( $m$  and  $n$  /  $k$  and  $l$  ✓).
- (c) Then  $\angle 1 \cong \angle 3$  because they are both congruent to  $\angle 2$ .

**Problem 2** Adapted from Ohio's 2018 Geometry released item 21.

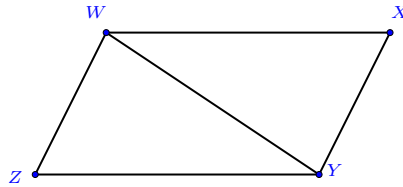
Given the parallelogram  $WXYZ$ , prove that  $\overline{WX} \cong \overline{YZ}$ .

---

Learning outcomes:

Author(s): Brad Findell

Parallelogram



Complete the proof below:

- (a)  $\angle ZWY \cong \angle XYW$  as alternate interior angles for parallel segments  $\overline{WZ}$  and  $\overline{XY}$
- (b)  $\angle ZYW \cong \angle XWY$  as alternate interior angles for parallel segments  $\overline{WX}$  and  $\overline{YZ}$ .
- (c)  $\overline{WY} \cong \overline{WY}$  because a segment is congruent to itself.
- (d)  $\triangle WYZ \cong \triangle YWX$  by the ASA criterion.
- (e) Then  $\overline{WX} \cong \overline{YZ}$  as corresponding parts of congruent triangles.

*Fixnote: Use drop-down menus. Maybe number the angles.*