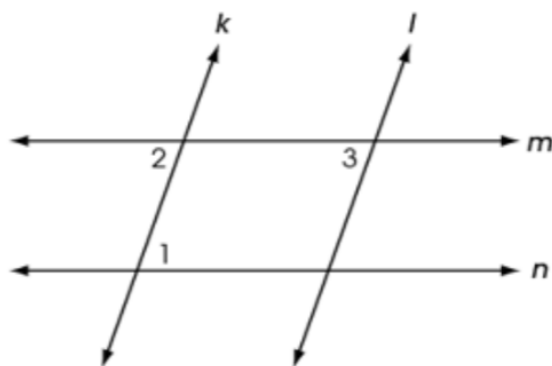


# Quadrilaterals

*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  $\angle 2$ .

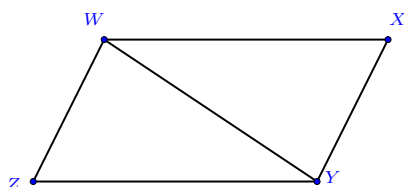
**Problem 2** Adapted from Ohio's 2018 Geometry released item 21.

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

---

Learning outcomes:

Author(s): Brad Findell



*Fixnote: It really would help to have an online environment that allows students to mark diagrams.*

Complete the proof below:

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

*Fixnote: Maybe number the angles.*