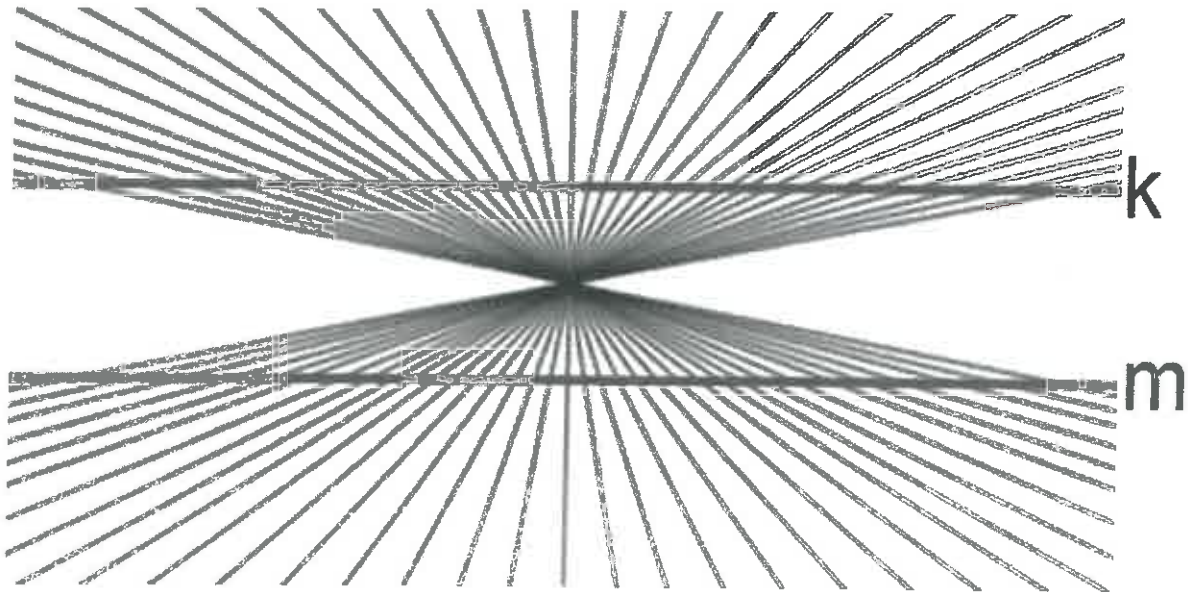


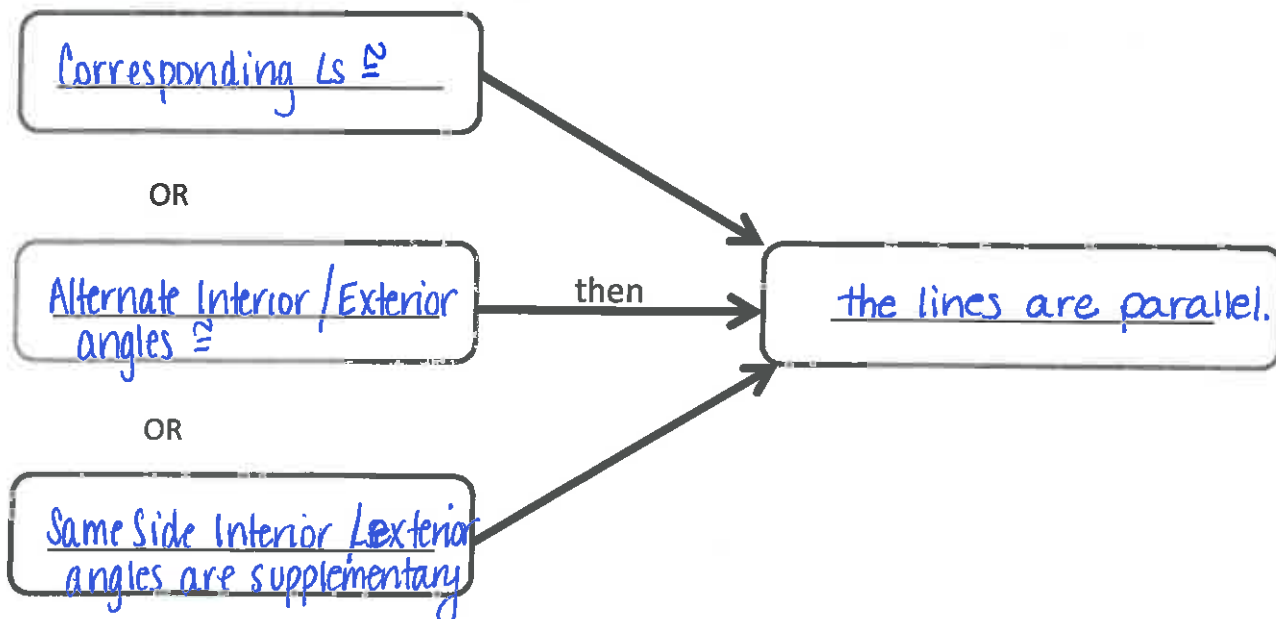
Proving Lines Parallel

Are lines m & k straight? Are lines m & K parallel?



- * draw a transversal
- * measure the \angle s.

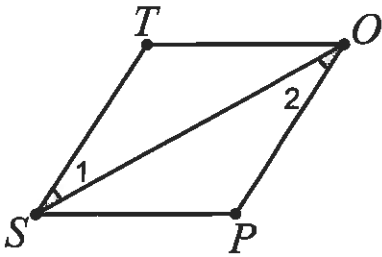
If 2 lines are cut by a transversal with...



Example: Based on the given angles in each picture:

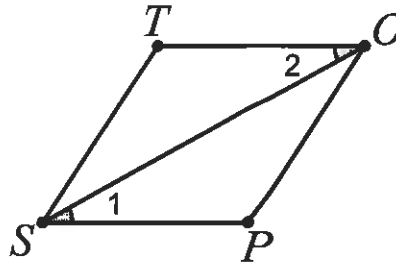
- State which lines are parallel.
- State the reason why the lines are parallel.

1.



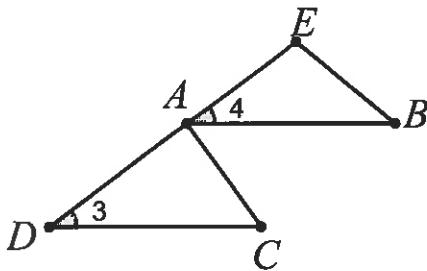
$\overline{ST} \parallel \overline{OP}$ 2 lines cut by a trans w/ alt. int $\angle s \cong$, the lines are \parallel .

2.



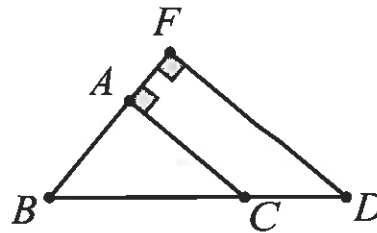
$\overline{TO} \cong \overline{SP}$ 2 lines cut by a trans with alt int $\angle s \cong$, the lines are \parallel .

3.



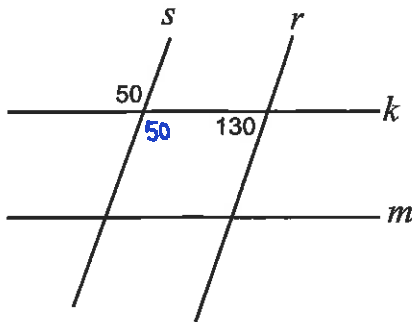
$\overline{AB} \parallel \overline{DC}$ 2 lines cut by a trans with corr $\angle s \cong$, the lines are \parallel .

4.



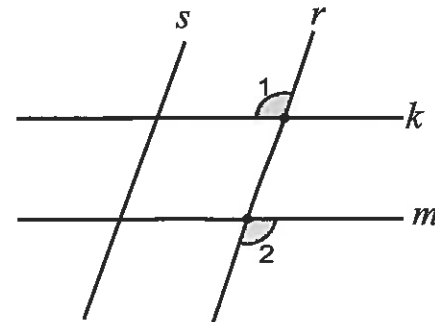
$\overline{AC} \parallel \overline{FD}$ 2 lines cut by a trans with same side int $\angle s$ supp, the lines are \parallel .

5.



$s \parallel r$ 2 lines cut by a trans with same side int $\angle s$ supp, the lines are parallel.

6.

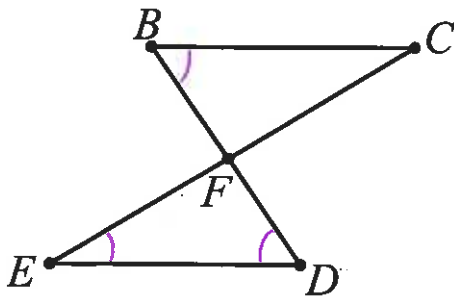


$k \parallel m$ 2 lines cut by a trans with alternate exterior angles \cong the lines are \parallel .

Two - Column Proof:

1. Given: $\angle E \cong \angle B$
 $\angle E \cong \angle D$

Prove: $\overline{BC} \parallel \overline{ED}$



① $\angle E \cong \angle B$
 $\angle E \cong \angle D$

② $\angle B \cong \angle D$

③ $\overline{BC} \parallel \overline{ED}$

① given

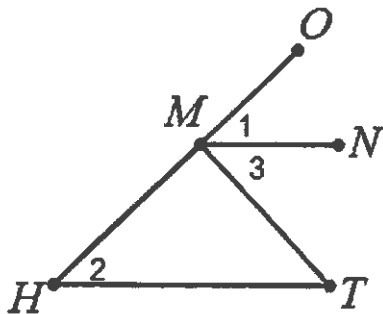
② transitive

③ 2 lines cut by a trans with alt int $\angle s \cong$, the lines are \parallel .

Flow Chart Proof:

2. Given: \overline{MN} bisects $\angle OMT$
 $\angle 3 \cong \angle 2$

Prove: $\overline{MN} \parallel \overline{HT}$



\overline{MN} bisects $\angle OMT$
 Given

$\angle 3 \cong \angle 2$
 Given

$\angle 1 \cong \angle 3$

\angle bis \div \angle into
 $2 \cong \angle s$

$\angle 1 \cong \angle 2$

transitive

$\overline{MN} \parallel \overline{HT}$

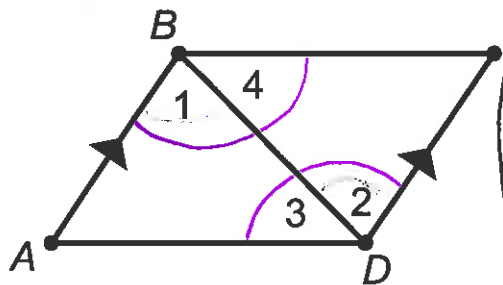
2 lines cut by a trans with corr $\angle s \cong$, the lines are \parallel .

3. Complete a Two-Column, Paragraph, or Flow Chart Proof:

Given: $\overline{AB} \parallel \overline{CD}$
 $\angle ABC \cong \angle CDA$

Prove: ABCD is a parallelogram

Hint: Use the Subtraction Method.



$\overline{AB} \parallel \overline{CD}$ lines cut by a trans, alt int $\angle s \cong$

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

$$\angle 1 \cong \angle 2$$

$$\angle ABC \cong \angle CDA$$

$$m\angle ABC = m\angle 1 + m\angle 4$$

$$m\angle CDA = m\angle 2 + m\angle 3$$

\angle addition

$$m\angle 1 + m\angle 4 = m\angle 2 + m\angle 3$$

substitution

$$\angle 4 = \angle 3$$

subtr. prop of eq.

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

2 lines cut by a trans with alt int $\angle s \cong$, the lines are \parallel .

ABCD is a parallelogram

a quad w/ 2 sets of opp sides parallel is a \square