

Mr. Svarc's Magic???

VOLUNTEER...

1. Pick a number between 50 and 99.
2. Add 63.
3. Cross out the hundreds digit and add to the units digit.
4. Subtract the answer from the original number.

READY TO BE AMAZED???

Parallel Lines???

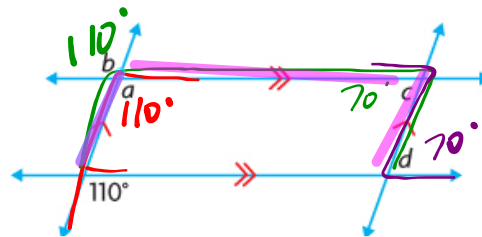
What you should have found by measuring the angles above is that when two lines are parallel and intersected by a transversal:

- The measures of corresponding angles, alternate interior angles, and alternate exterior angles will be equal. (If such angles do not have equal measures, then the lines are not parallel.)
- Interior and exterior angles on the same side of a transversal will be supplementary. (If they are not, then the lines are not parallel.)

p. 76

EXAMPLE 2 Using reasoning to determine unknown angles

Determine the measures of a , b , c , and d .



Kebeh's Solution

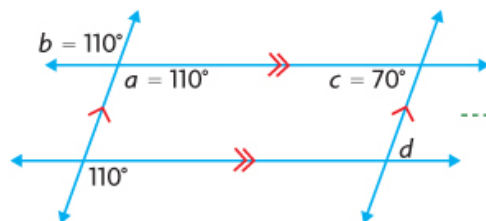
$\angle a = 110^\circ$

The 110° angle and $\angle a$ are corresponding. Since the lines are parallel, the 110° angle and $\angle a$ are equal.

$\angle a = \angle b$
 $\angle b = 110^\circ$

Vertically opposite angles are equal.

$\angle c + \angle a = 180^\circ$
 $\angle c + 110^\circ = 180^\circ$
 $\angle c = 70^\circ$



$\angle c$ and $\angle a$ are interior angles on the same side of a transversal. Since the lines are parallel, $\angle c$ and $\angle a$ are supplementary.

I updated the diagram.

$\angle c = \angle d$
 $\angle d = 70^\circ$

$\angle c$ and $\angle d$ are alternate interior angles. Since the lines are parallel, $\angle c$ and $\angle d$ are equal.

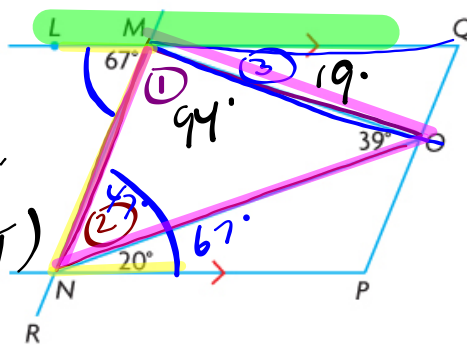
The measures of the angles are:
 $\angle a = 110^\circ$; $\angle b = 110^\circ$;
 $\angle c = 70^\circ$; $\angle d = 70^\circ$.

EXAMPLE 3 Using reasoning to solve problems

JUSTIFY!!!

Determine the measures of $\angle NMO$, $\angle MNO$, and $\angle QMO$.

① 94° (SATT)
 ② 47° (AIA)
 ③ 19° (SAT)



(Reason)

Tyler's Solution

MN is a transversal of parallel lines LQ and NP .

MN intersects parallel lines LQ and NP .

$$\begin{aligned} \angle MNO + 20^\circ &= 67^\circ \\ \angle MNO &= 47^\circ \end{aligned}$$

Since $\angle LMN$ and $\angle MNP$ are alternate interior angles between parallel lines, they are equal.

$$\begin{aligned} \angle NMO + \angle MNO + 39^\circ &= 180^\circ \\ \angle NMO + (47^\circ) + 39^\circ &= 180^\circ \\ \angle NMO + 86^\circ &= 180^\circ \\ \angle NMO &= 94^\circ \end{aligned}$$

The measures of the angles in a triangle add to 180° .

$$\begin{aligned} \angle NMO + \angle QMO + 67^\circ &= 180^\circ \\ (94^\circ) + \angle QMO + 67^\circ &= 180^\circ \\ 161^\circ + \angle QMO &= 180^\circ \\ \angle QMO &= 19^\circ \end{aligned}$$

$\angle LMN$, $\angle NMO$, and $\angle QMO$ form a straight line, so their measures must add to 180° .

The measures of the angles are:

$$\angle MNO = 47^\circ; \angle NMO = 94^\circ; \angle QMO = 19^\circ.$$

Homework...

p. 72: #2, 5

p. 78: #1, 2, 4, 15