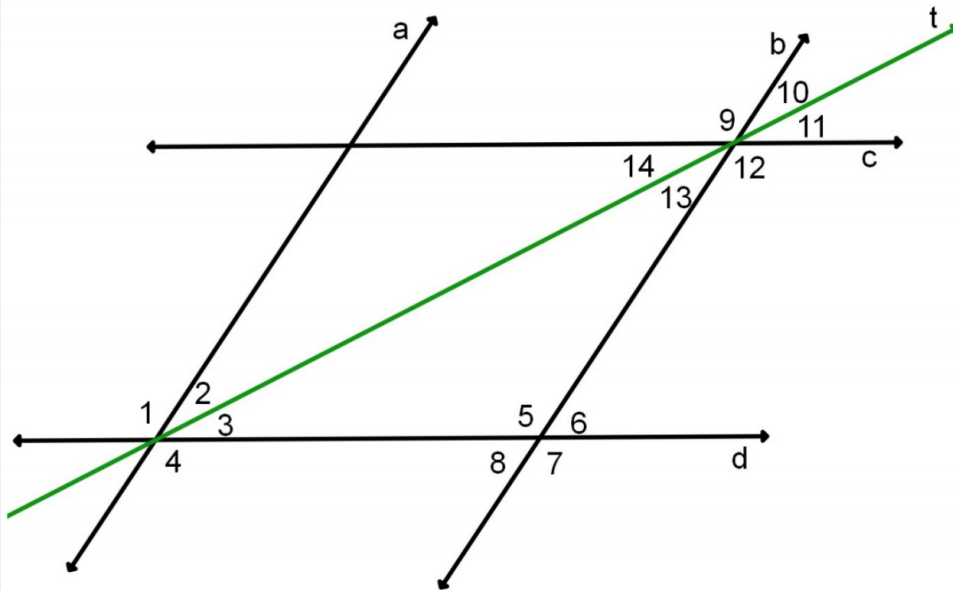


Name the parallel lines and transversal that form each pair of angles.
What name describes the pair of angles? (classify them)



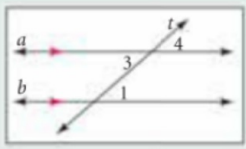
Angle pair	Parallel Lines	Transversal	Name, if they have one.
2 & 13	$a \parallel b$	t	alt. interior
12 & 6	$c \parallel d$	b	same-side Int.
5 & 1	$a \parallel b$	d	Corresp.
9 & 5	$c \parallel d$	b	"
4 & 8	$a \parallel b$	d	same-side Int.
8 & 9	$c \parallel d$	b	" " ext.
11 & 3	$c \parallel d$	t	Corresp.
12 & 5	$c \parallel d$	b	Alt. int. \angle 's.

You can display the steps that prove a theorem in a two-column proof.

Section 3-1 Cont. 2

Given: $a \parallel b$ what you know

Prove: $\angle 1 \cong \angle 3$ what you must show



deductive steps that connect what you know to what you must show

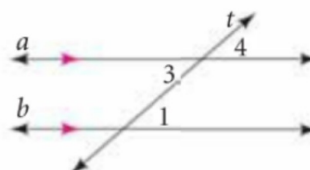
Statements	Reasons
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____

Example 1: Proving Alt. Interior Angles are Congruent

If a transversal intersects two parallel lines, then alternate interior angles are congruent.

Given: $a \parallel b$

Prove: $\angle 1 \cong \angle 3$

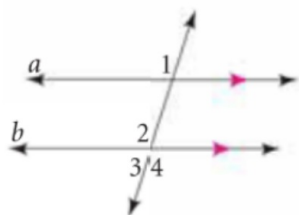


Statements	Reasons
① $a \parallel b$	① Given
② $\angle 1 \cong \angle 4$	② corresp.
③ $\angle 3 \cong \angle 4$	③ vert. \angle 's
④ $\angle 1 \cong \angle 3$	④ TRANS prop.

Example 2: Proving Alt. Exterior Angles are Congruent

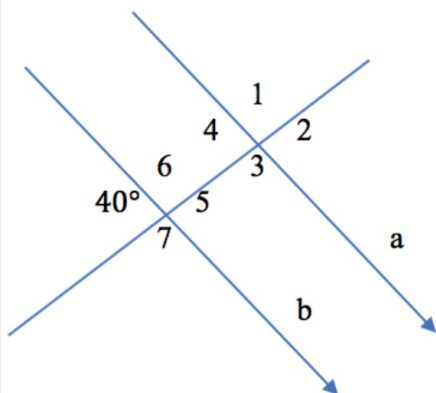
Given: $a \parallel b$

Prove: $\angle 1 \cong \angle 4$



Statements	Reasons
① $a \parallel b$	① Given
② $\angle 1 \cong \angle 2$	② Corresp.
③ $\angle 2 \cong \angle 4$	③ Vert.
④ $\angle 1 \cong \angle 4$	④ Trans. prop.

Example 3: Finding angle measures

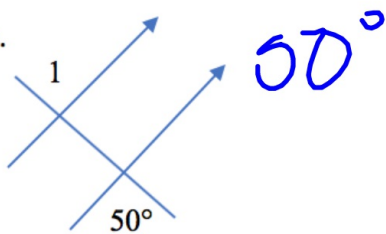


Given: $a \parallel b$. Find the measure of the numbered angles

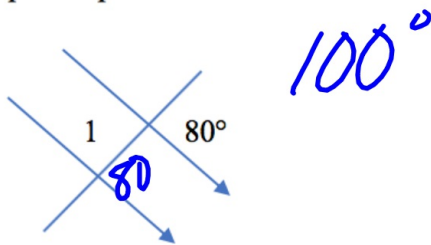
$$\begin{aligned} 5 &= 40^\circ & 3 &= 140^\circ \\ 7 &= 140^\circ & 1 &= 140^\circ \\ 6 &= 140^\circ & 2 &= 40^\circ \\ 4 &= 40^\circ \end{aligned}$$

Example 4: Find the measure of Angle 1 in each pair of parallel lines.

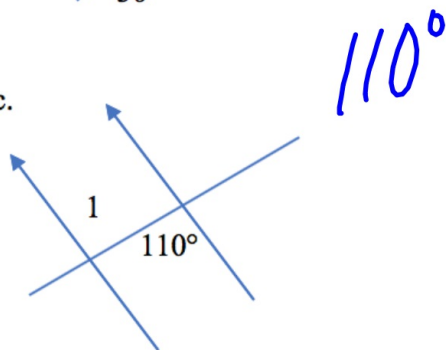
a.



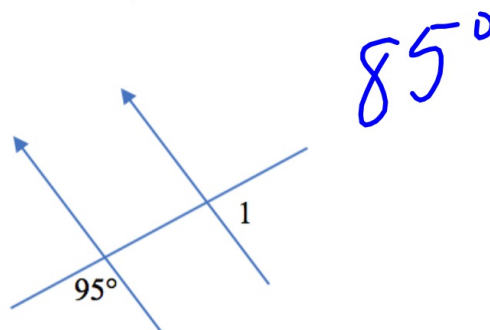
b.



c.



d.



H. Geometry

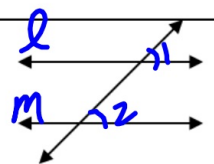
3-2: Proving Lines Parallel

Objective: To use a transversal in proving lines parallel

Postulate 3-2: Converse of the Corresponding Angles Postulate

If two lines and a transversal form corresponding angles that are congruent,

$l \parallel m$ the two lines are \parallel . the

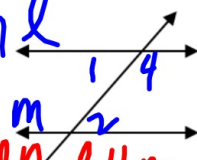


In Lesson 3-1, you proved four theorems based on the corresp. \angle post.

You can also prove theorems that are based on its converse. Let's take a look.

Theorem 3-5: Converse of the Alternate Interior Angles Theorem

If two lines and a transversal form alt. int. \angle 's that are \cong , then the two lines are parallel.
if $\angle 1 \cong \angle 2$, then $l \parallel m$.



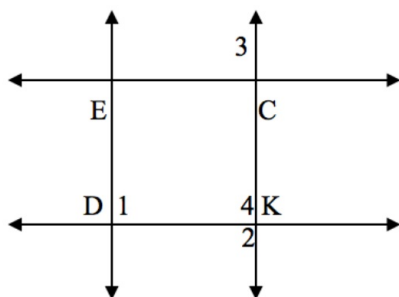
Theorem 3-6: Converse of the Same-Side Interior Angles Theorem

If two lines and a transv. form sse \angle 's that are suppl., then the two lines are parallel.

if $\angle 2$ & $\angle 4$ are suppl, then $l \parallel m$.

Example 1:

A. Which lines, if any, must be parallel if $m\angle 1 = m\angle 2$? Justify your answer with a theorem or postulate.



$\overline{DE} \parallel \overline{KC}$ by
conv. of Alt.
Int \angle 's.

B. Which lines if any, must be parallel if $m\angle 3 = m\angle 4$? Explain.

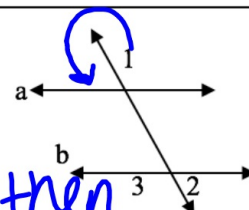
$\overline{EC} \parallel \overline{DK}$ conv.
corr \angle 's
post.

Theorem 3-7: Converse of the Alternate Exterior Angles Theorem

If

two lines and trans. form
alt. ext. \angle s that are \cong

then the two lines are parallel.



IF $\angle 1 \cong \angle 2$, then
all b.

Theorem 3-8: Converse of the Same-Side Exterior Angles Theorem

If two lines and a transversal form same-side exterior angles that are supplementary, then

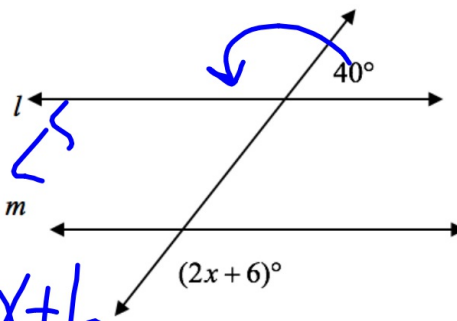
the two lines are \parallel .

IF $\angle 1$ & $\angle 3$ are
supp. then
all b.

Example 2:

A. Find the value of x for which $l \parallel m$.

alt ext \angle s



$$40 = 2x + 6$$

$$2x = 34$$

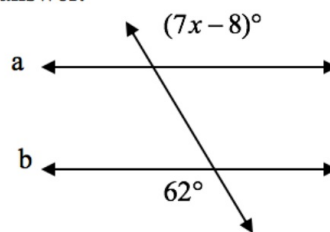
$$x = 17$$

B. Find the value of x for which $a \parallel b$. Explain how you can check your answer.

$$7x - 8 = 62$$

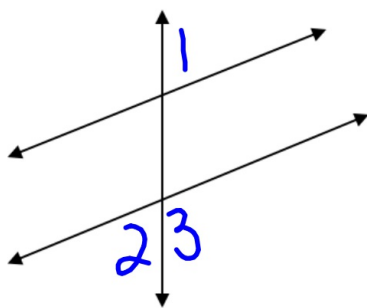
$$7x = 70$$

$$x = 10$$



Example 3:

A. Two workers are painting lines for angled parking spaces. The first worker paints a line so that $m\angle 1 = 60^\circ$. The second worker paints a line so that $m\angle 2 = 60^\circ$. Explain why their lines are parallel.



alt ext \angle 's
are \cong therefore
the lines are \parallel .

B. If the second worker uses $\angle 3$, what should $m\angle 3$ be for parallel lines? Explain.

$$m\angle 3 = 120^\circ$$

$\angle 2 \rightarrow$ linear pair

$\angle 1 \rightarrow$ SSE \angle 's are supp!

Hwk #14 -

Sect. 3-2

Pages: 137-139

Problems: 1, 3, 4, 7, 8, 12-15, 21, 24, 42

IXL #7 - D.3 & D.4 due Friday at 4pm!