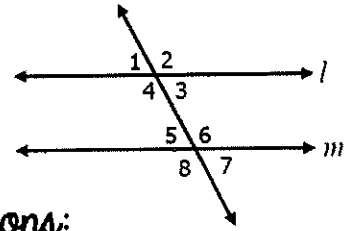


# Proving Lines Parallel

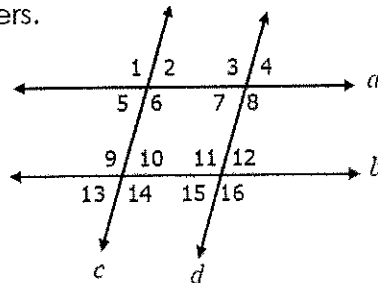


You can prove lines are parallel by the following reasons:

<b>Corresponding Angles Converse</b>	If two lines are cut by a transversal so that <b>corresponding angles</b> are <b>congruent</b> , then the lines are parallel. Example: <u>If <math>\angle 1 \cong \angle 5</math>, then <math>l \parallel m</math></u>
<b>Alternate Interior Angles Converse</b>	If two lines are cut by a transversal so that <b>alternate interior angles</b> are <b>congruent</b> , then the lines are parallel. Example: <u>If <math>\angle 4 \cong \angle 6</math>, then <math>l \parallel m</math></u>
<b>Alternate Exterior Angles Converse</b>	If two lines are cut by a transversal so that <b>alternate exterior angles</b> are <b>congruent</b> , then the lines are parallel. Example: <u>If <math>\angle 2 \cong \angle 8</math>, then <math>l \parallel m</math></u>
<b>Same Side Interior Angles Converse</b>	If two lines are cut by a transversal so that <b>same side interior angles</b> are <b>supplementary</b> , then the lines are parallel. Example: <u>If <math>m\angle 4 + m\angle 5 = 180</math>, then <math>l \parallel m</math></u>

## Practice!

Given the following information, determine which lines, if any, are parallel. State the converse that justifies your answers.

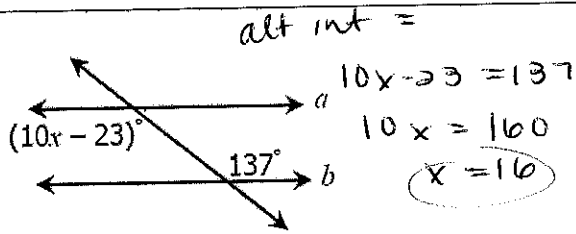


Given	Parallel Lines	Converse
a. $\angle 2 \cong \angle 4$	$c \parallel d$	corresponding converse
b. $\angle 5 \cong \angle 10$	$a \parallel b$	alt int converse
c. $m\angle 6 + m\angle 10 = 180$	$a \parallel b$	SSI converse
d. $\angle 1 \cong \angle 14$	$a \parallel b$	alt ext converse
e. $m\angle 14 + m\angle 15 = 180$	$c \parallel d$	SSI converse
f. $\angle 11 \cong \angle 16$	none	vertical angles
g. $\angle 4 \cong \angle 15$	$a \parallel b$	alt ext converse
h. $\angle 10 \cong \angle 12$	$c \parallel d$	corresp. converse
i. $m\angle 9 + m\angle 13 = 180$	none	linear pair
j. $\angle 2 \cong \angle 7$	$c \parallel d$	alt int converse
k. $\angle 6 \cong \angle 11$	none	none

# Proving Lines Parallel with Algebra

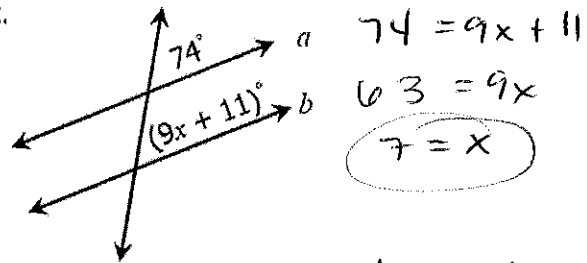
Directions: Find  $x$  so that  $a \parallel b$ . State the converse used.

1.



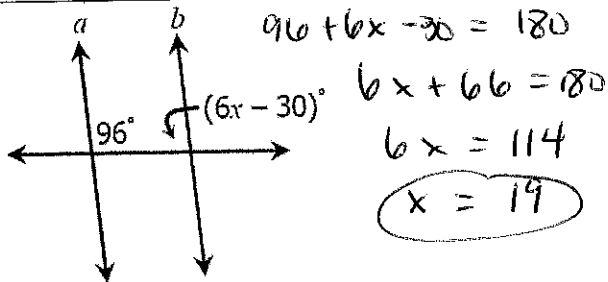
Converse: alt int converse

2.



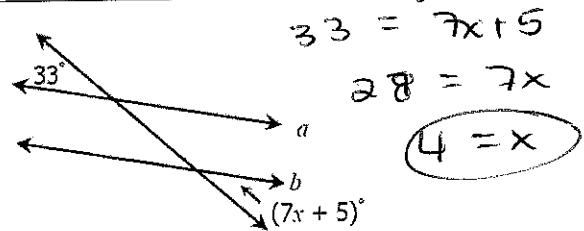
Converse: corresponding conv.

3.



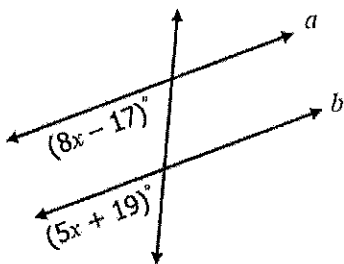
Converse: same side int converse

4.



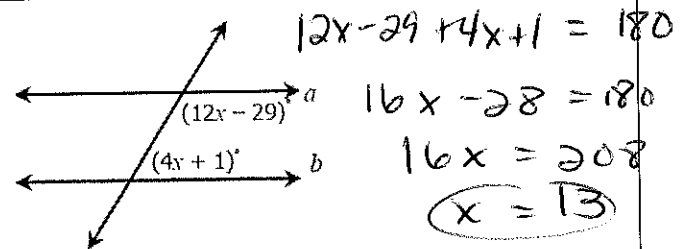
Converse: alt ext converse

5.



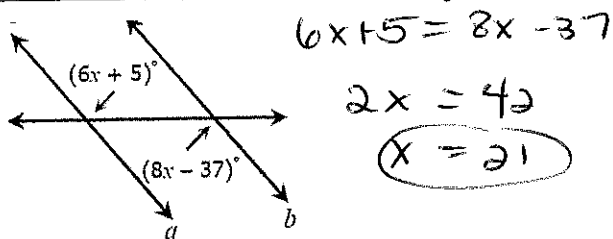
Converse: corresponding converse

6.



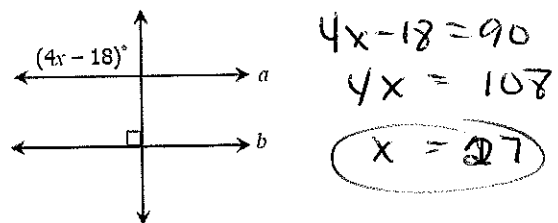
Converse: same side int converse

7.



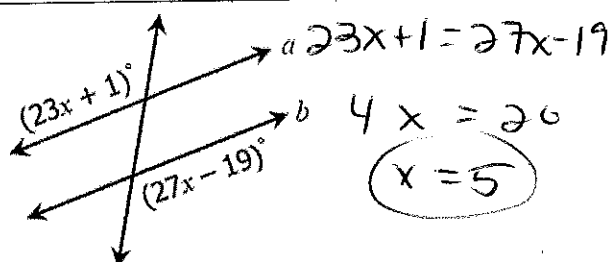
Converse: alt. int converse

8.



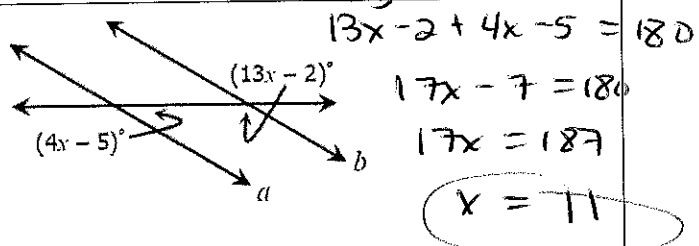
Converse: corresponding converse

9.



Converse: alt ext converse

10.



Converse: same side int converse