Talk the Talk

Here are all the converse postulates you have proven. Each converse conjecture you have proven is a new theorem.

Corresponding Angle Converse Postulate: If two lines intersected by a transversal form congruent corresponding angles, then the lines are parallel.

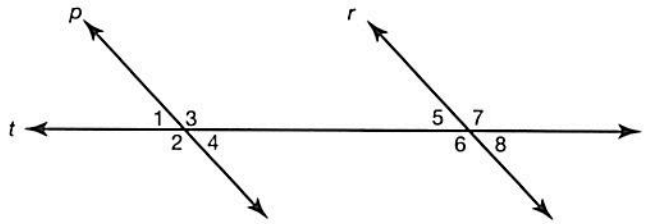
Alternate Interior Angle Converse Theorem: If two lines intersected by a transversal form congruent alternate interior angles, then the lines are parallel.

Alternate Exterior Angle Converse Theorem: If two lines intersected by a transversal form congruent alternate exterior angles, then the lines are parallel.

Same-Side Interior Angle Converse Theorem: If two lines intersected by a transversal form supplementary same-side interior angles, then the lines are parallel.

Same-Side Exterior Angle Converse Theorem: If two lines intersected by a transversal form supplementary same-side exterior angles, then the lines are parallel.

Use the diagram to answer the questions.



1. Which theorem or postulate would use $\angle 2 \cong \angle 7$ to justify line p is parallel to line r?

2. Which theorem or postulate would use $\angle 4 \cong \angle 5$ to justify line p is parallel to line r?

3. Which theorem or postulate would use $\angle 1 \cong \angle 5$ to justify line p is parallel to line r?

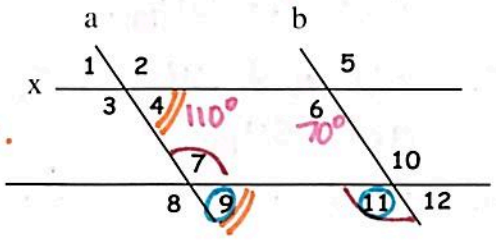
PAP Geometry 2.5 Name_____

Prove Lines are Parallel

For 1 - 5, using the given information determine if any lines are parallel.

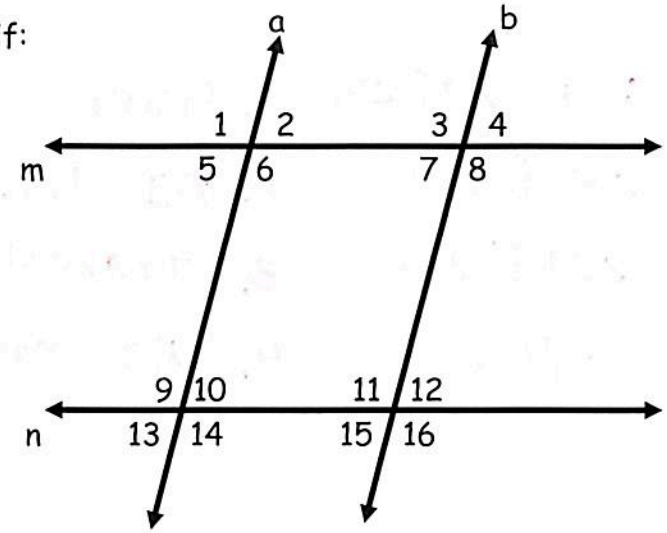
If yes, use a postulate or theorem to tell why.

1. $\angle 7 \cong \angle 11$ a ∥ b AI converse thm
2. $\angle 4 \cong \angle 9$ x ∥ y corr converse post.
3. $\angle 9 \cong \angle 11$ none
4. $\angle 6 \cong \angle 5$ none
5. $\angle 6 = 70°$ and $\angle 4 = 110°$ a∥b SSI converse thm



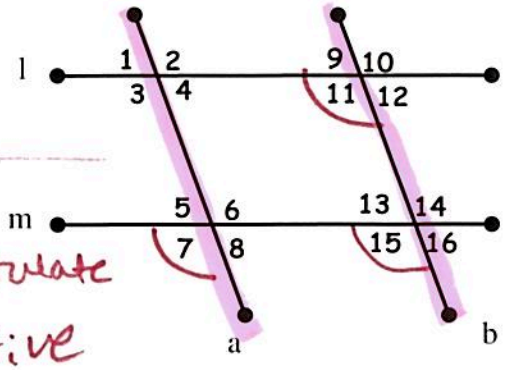
6. Determine what lines must be parallel if:

a∥b a) $\angle 2 \cong \angle 7$
m∥n b) $\angle 6 \cong \angle 14$
none c) $\angle 5 \cong \angle 9$
none d) $\angle 2 \cong \angle 12$
none e) $\angle 3 \cong \angle 10$
m∥n f) $\angle 6$ supplements $\angle 10$
m∥n g) $\angle 8$ supplements $\angle 12$
a∥b h) $\angle 12 \cong \angle 13$



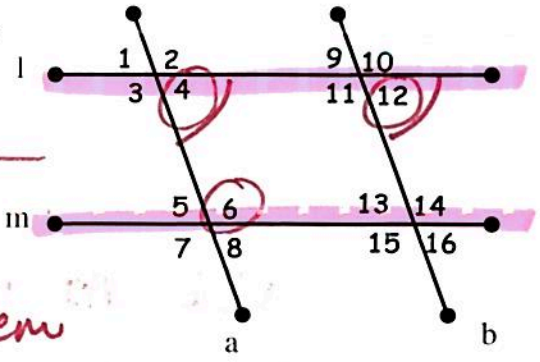
7. Given: a // b; $\angle 7 \cong \angle 11$

Prove: l // m



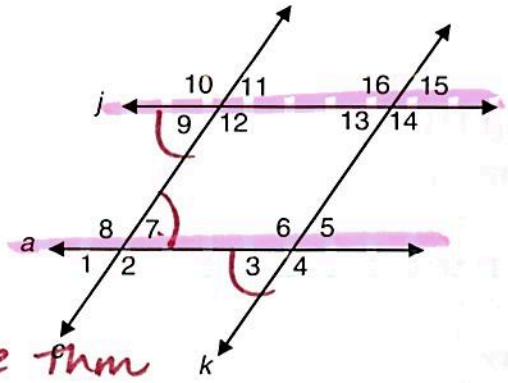
Statements	Reasons
1. a∥b, $\angle 7 \cong \angle 11$	1. Given
2. $\angle 7 \cong \angle 15$	2. corr. postulate
3. $\angle 11 \cong \angle 15$	3. transitive
4. l ∥ m	4. corr. converse post.

8. Given: l // m; ∠6 and ∠12 are supplementary
Prove: a // b



Statements	Reasons.
1. $l \parallel m$, ∠6 and ∠12 are supp.	1. Given
2. ∠6 and ∠4 are supp.	2. SSI theorem
3. $\angle 4 \cong \angle 12$	3. Congruent Supp. thm
4. $a \parallel b$	4. Corr. converse post.

9. Given: $j \parallel a$, $\angle 9 \cong \angle 3$
Prove: $c \parallel k$



1. $j \parallel a$ $\angle 9 \cong \angle 3$	1. Given
2. $\angle 9 \cong \angle 7$	2. AI Theorem
3. $\angle 7 \cong \angle 3$	3. Transitive
4. $c \parallel k$	4. AI converse thm

For #10 and #11, write the converse for each conditional statement:

10) If points lie on the same line, then they are collinear.

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11) If two angles are supplementary, then their sum is 180°.

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