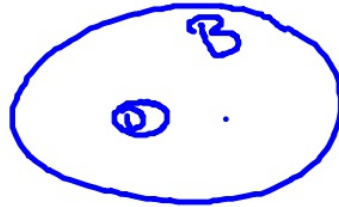


Good morning: Warm up in notebooks (don't have to write questions down, just answer #1-4)

Axioms:

All doodads are boozles.

Not all boozles are doodads.



Rate each as true or false:

1. If it is a boozle, then it is a doodad. F
2. If it not a doodad, then it is not a boozle. F
3. If it is a doodad, then it is a boozle. T
4. If it is not a boozle, then it is not a doodad. T

Reminders:

- tutoring today 4-5p
- reassess in any DS except Weds.
- next assessment: Tuesday 9/25

[Hint: rewrite the axioms as a single if-then statement]

Assessments are being passed back

Only new skill was the front side, GPE-B7a

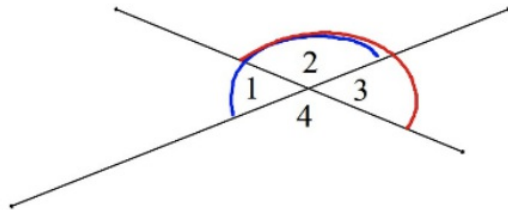
Homework for it is p. 97-98, #2-14 (evens) and 15

Retakes available in any DS except Wednesday

## Our first geometry proof:

### my first geometry proof

Why are  $\angle 1$  and  $\angle 3$  the same?



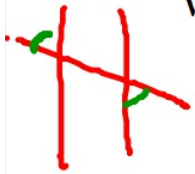
We are given 2 intersecting lines forming 4 angles. We wish to prove vertical angles, like  $\angle 1$  and  $\angle 3$  are congruent. We observe that  $\angle 1 + \angle 2 = 180^\circ$  because they make a line. Similarly,  $\angle 2 + \angle 3 = 180^\circ$  because they make a line. By the transitive property,  $\angle 1 + \angle 2 = \angle 2 + \angle 3$ . Subtracting  $\angle 2$  from both sides leaves  $\angle 1 = \angle 3$ . Thus they are congruent.

QED

## Vertical Angles Theorem

If two angles are vertical angles, then they are congruent.

Write the converse, inverse, and contrapositive of this statement.



$$Q \rightarrow P \quad \sim P \rightarrow \sim Q \quad \sim Q \rightarrow \sim P$$

Converse: If they are congruent, then two angles are vertical angles. **F**

Inverse: If two angles are not vertical angles, then they are not congruent. **F**

Contrapositive: If they're not congruent, then they're not vertical angles. **T**

---

● If two lines cross at a right angle, then they are perpendicular.

Write the converse, inverse, and contrapositive of this statement.

Then rate each as true or false.

Converse: ● If they are perpendicular, then two lines cross at a right angle. True

Inverse: If two lines don't cross at a right angle, then they aren't perpendicular. True

Contrapositive: If two lines aren't perpendicular, then they don't cross at a right angle. True

**BICONDITIONAL:**

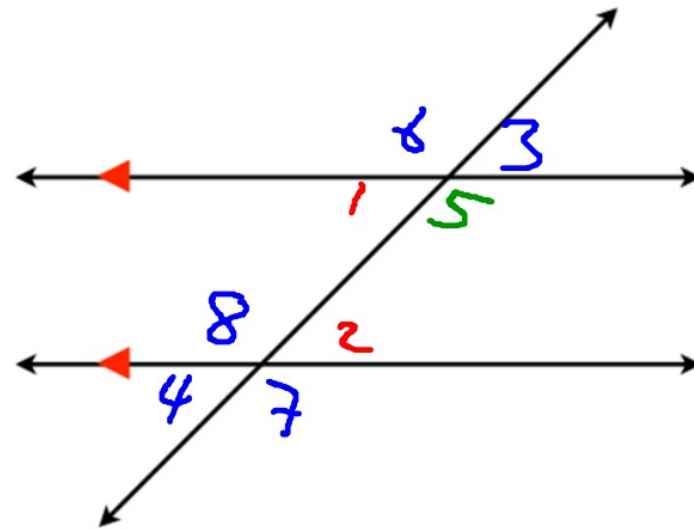
● Two lines cross at a right angle if and only if they are perpendicular.

## Angle Relationships Practice

Label the angles in the diagram so that they have the relationships described in the table.

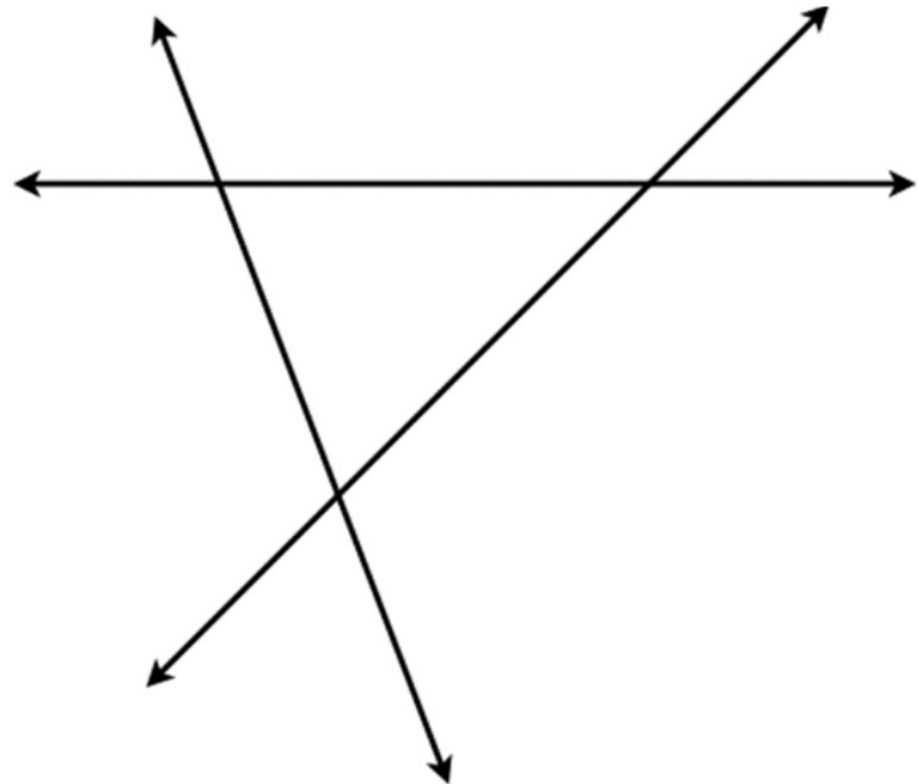
### Problem 1

Angles	Relationship
1, 2	Alternate Interior angles
3, 4	Alternate Exterior angles
6, 7	Alternate Exterior angles
6, 8	Corresponding angles
1, 3	Vertical angles
2, 5	Same-side Interior angles
2, 8	Linear Pair



**\*Given:** Angles 1 and 4 are interior angles of the triangle.

Angles	Relationship
3, 1	Alternate Interior angles
1, 10	Same-side interior
5, 1	Vertical angles
2, 10	Linear Pair
5, 2	Alternate exterior angles
10, 11	Corresponding angles
11, 1	Alternate interior angles
10, 12	Corresponding angles
9, 6	Corresponding angles
9, 11	Vertical angles
7, 3	Alternate exterior angles
2, 3	Vertical angles
8, 3	Same-side interior

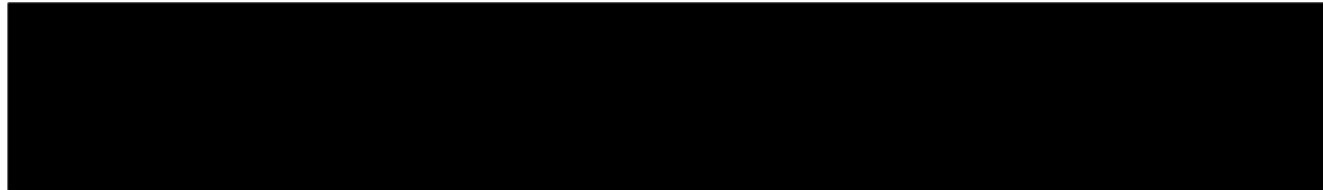


try this at home...let me know if/when you get it!

To prove a statement in Euclidean geometry, you need to use logical reasoning

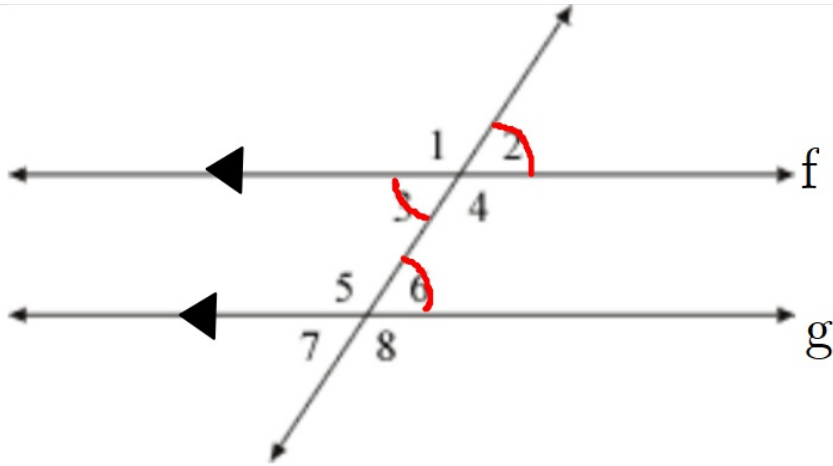
We start with a simple postulate:

*Corresponding angles of parallel lines are congruent.*



<https://www.youtube.com/watch?v=b49JnSpiogE>





Given:  $f \parallel g$

Prove:  $\angle 3 \cong \angle 6$

Write a paragraph that proves why  $\angle 3$  is congruent to  $\angle 6$ .

Given  $f$  and  $g$  parallel, with a transversal.

Want to prove  $\angle 3 \cong \angle 6$

We see that  $\angle 3$  and  $\angle 2$  are vertical, thus congruent.

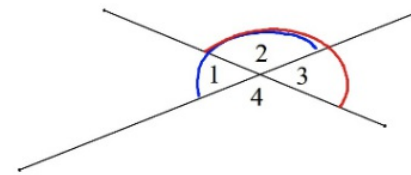
Angle  $\angle 2$  and  $\angle 6$  are corresponding thus congruent.

\*\*By the transitive property,  $\angle 3 \cong \angle 2$ ,  $\angle 2 \cong \angle 6$ , therefore  $\angle 3 \cong \angle 6$ .

QED

#### my first geometry proof

Why are  $\angle 1$  and  $\angle 3$  the same?



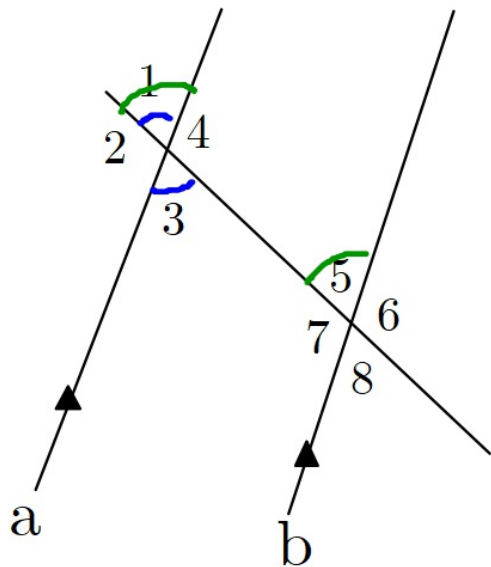
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QED

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

PROVEN: 9/18/18

What's wrong with this "proof"?



Given:  $a \parallel b$

Prove:  $\angle 3 = \angle 5$

③  $\angle 3 \cong \angle 5$  and

①  $\angle 3 = \angle 1$  because they are vertical.

Therefore  $\angle 5 \cong \angle 1$ . So  $a \parallel b$ .

②

HW

p. 87 #1-7