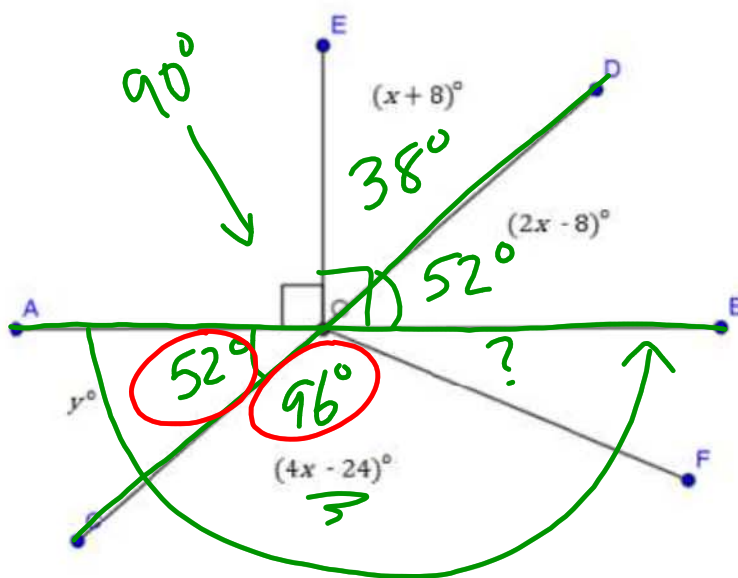


Geometry CC – Unit 1
Lesson 4: Auxiliary Lines

Name: _____
Date: _____

Warm-up!

Using the diagram to solve for x and y. Give reason for each equation used.



$$x + 8 + 2x - 8 = 90$$

$$3x = 90$$

$$x = 30$$

$$4x - 24$$

$$4(30) - 24$$

$$120 - 24$$

Find the measure of $\angle BOF$ and give a reason for your calculation

$$52 + 96 + ? = 180$$

$$148 + ? = 180$$

$$? = 32^\circ$$

$\angle BOF = 32^\circ$

If we already know two lines are parallel, then we can say...

- a. "If two parallel lines are cut by a transversal, then the corresponding angles are congruent"
- b. "If two parallel lines are cut by a transversal, then the alternate interior angles are congruent"
- c. "If two parallel lines are cut by a transversal, then the same side interior angles are supplementary"

If we need to prove/justify/explain why two lines are parallel, we can say...

a. "If two lines are cut by a transversal such that the corresponding angles are congruent, then the lines are parallel."

b. "If two lines are cut by a transversal such that the alternate interior angles are congruent, then the lines are parallel."
exterior

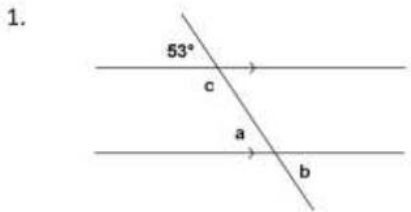
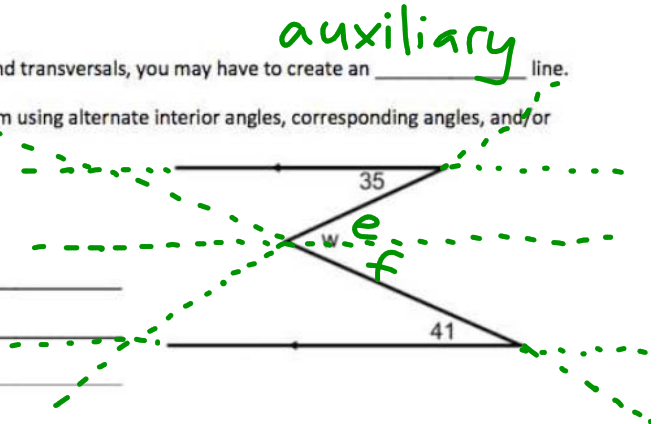
c. "If two lines are cut by a transversal such that the same-side interior angles are supplementary, then the lines are parallel."

Sometimes, in order to solve a problem using parallel lines and transversals, you may have to create an auxiliary line.

Example 1. How can we find the measure of W in the diagram using alternate interior angles, corresponding angles, and/or same side interior angles?

$m\angle W =$ _____

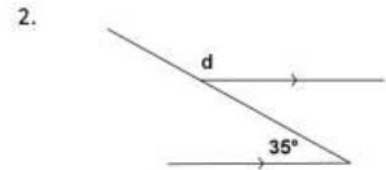
Reason(s): _____



$m\angle a =$ _____

$m\angle b =$ _____

$m\angle c =$ _____



$m\angle d =$ _____