**Math III Unit 6: LINES, ANGLES, QUADRILATERALS, & PROOFS
Lauren Winstead, Heritage High School**

**Main topics of instruction:**

1) Lines, angles, and intro to proofs

2) Intro to flow charts and two-column proofs

3) Parallelograms

**Day 1: Lines, Angles, & Intro to Proofs**



* Angles whose measures have a sum of 90° are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



* Vertical angles have equal measures, so they are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



* Angles whose measures have a sum of 180° are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



* An angle that measures less than 90° is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angle.



Parallel lines do not intersect, but **perpendicular lines intersect at a** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A **transversal** is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Alternate angles** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.





 **You try!** If $m∠2=2x+5$ and $m∠7=4x-13$,

 find the measures of all angles.

**Corresponding angles** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



The $63°$ angle and $∠1$ are corresponding angles, because they are matching pairs created by two parallel lines and a transversal.

**Intro to Two-**

**lumn Proofs**



**You try! Given** $m∠1=2x+18$ and $m∠5=5x-21$,

find all the angles.

**THEOREMS:**

* **If two lines are parallel, then the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are congruent.**
* **If two lines are parallel, then the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are congruent.**
* **If two lines are parallel, then the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are congruent.**

**The CONVERSE is also true:**

* **If alternate interior/alternate exterior/corresponding angles are congruent, then \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

**Let’s try some proofs!**



**Reasons**

**Statements**

**Try on your own:**



**Try one more!**





**Try a few more… this time with equations! Solve for x.**





**Day 2: More Work with Proofs**

**Consecutive angles: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

Which pairs of angles in the diagram are consecutive?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**THEOREM: If 2 lines are parallel, then consecutive angles are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

**CONVERSE: If consecutive angles are supplementary, then two lines are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

**You try!** In the diagram above, $m∠4=2x^{2}+5x+50$ and $m∠7=-x^{2}+2x+100.$

Find$m∠5$.

**Let’s practice some more proofs!**

**Example 2:** Use what you know about angles to write a two-column proof.



 **Given:** $∠2≅∠4$

 **Prove:** $m∠1≅m∠3$

**Statements Reasons**

**Try on your own!** Use what you know about angles to write a two-column proof.



 **Given:** $m∠1+m∠2=m∠4$

 **Prove:** $m∠3+m∠1+m∠2=180°$

**Statements Reasons**

**Try one more!** Use what you know about angles to write a two-column proof.



 **Given:** $∠1$ and $∠2$ are complementary.

 **Prove:** $∠3$ and $∠4$ are complementary.

**Statements Reasons**