4.2
Name (print first and last) _____ **Per**_____ **Date:**___11/13 due 11/15_
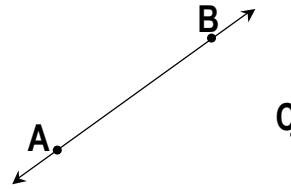**4.2 Angles: Transversals**   **Geometry Regents 2013-2014 Ms. Lomac**
SLO: I can solve problems involving angles formed by transversals.

(1) ☐ Construct 180° rotation of $\overleftrightarrow{AB}$ around point C.

(2) ☐ Refer to your work in problem 1 to complete the tasks below.

☐ (a) Rotating a line 180° around a point that is NOT on the line results in a line _____ to the original.

☐ (b) Rotations preserve _____ and _____ _____

(see unit 3). This means that $\overline{AB} \cong$ _____   and $\angle BAC \cong$ _____   and $\angle ABC \cong$ _____

because _____, _____, and _____ are images of _____, _____, and _____ under

rotation.

☐ (c) The construction from #1 is redrawn below twice. The first diagram is drawn with **transversal** $\overleftrightarrow{AA'}$ and the

second is drawn with **transversal** _____.
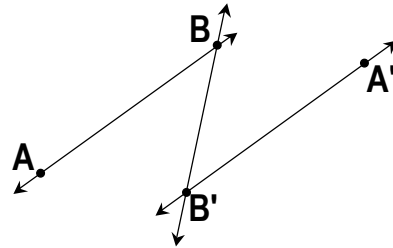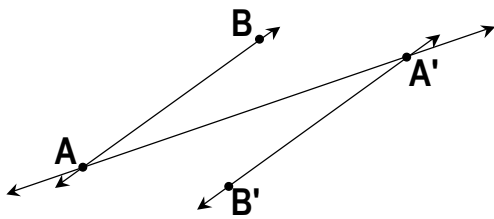
*In the first diagram show that $\angle BAA' \cong$ _____ with congruence marks:

*In the second diagram show that $\angle ABB' \cong$ _____ with congruence marks.

*These pairs of angles are called **alternate interior** angles because they are inside/outside (circle one) of the

parallel lines AND they are on the same/opposite (circle one) side of the transversal. These pairs of angles

are congruent because _____ maps to _____ under rotation and _____ maps to _____

under rotation and because rotation preserves _____ _____.

☐ (d) Summarize the relationship between parallel lines and **alternate interior** angles.

*Lines are _____ when **alternate interior** angles are _____*

        AND . . .

*Alternate interior* angles are _____ when lines are _____

☐ (e) In the diagram at right, is B' a 180° rotation of B around the center of the circle?

_____ Is A' a 180° rotation of A around the same center? _____Use your knowledge

of rotations to write a convincing argument that **alternate interior** angles are *not*

congruent when lines are *not* parallel. _____

_____

_____
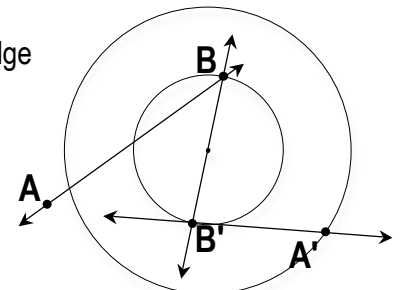
4.2

(3) ☐ Construct a translation of $\overleftrightarrow{AB}$ along vector CD by translating points A, B, and G.
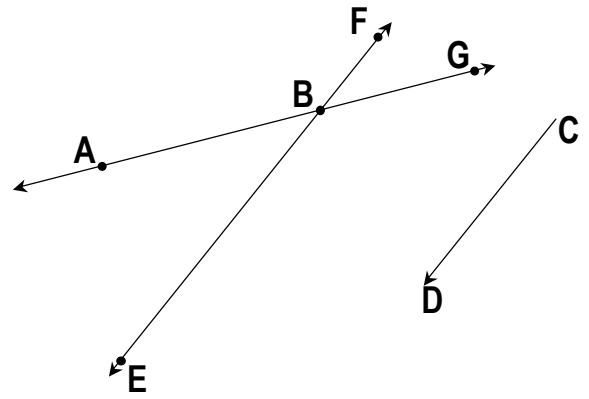
    ☐ (a) $\overleftrightarrow{AG} \parallel \overleftrightarrow{A'G'}$ because _____

_____

    ☐ (b) ∠FBG ≅ ∠FB'G' because translations

_____

_____

    ☐ (c) Mark the diagram to show that ∠FBG ≅∠FB'G'.

    ☐ (d) ∠FBG and ∠FB'G' are **corresponding** angles.

        List the other three pairs of corresponding angles.

        ∠FBA ≅ ∠_____   ∠ABE ≅ ∠_____   ∠GBE ≅ ∠_____

(4) ☐ Refer to your work in problem #3 to complete the tasks below.

    ☐ (a) Translating a line results in a line _____ to the original.

    ☐ (b) Translations preserve _____ and _____ _____
        (see unit 3)**.** This means that   ∠FBG ≅ ∠_____, ∠FBA ≅ ∠_____, ∠ABE ≅ ∠_____, and ∠GBE ≅
        ∠_____ because the second angle is an _____ of the first under translation.

    ☐ (c) The construction from #3 is redrawn below four times. The diagrams are drawn with **transversal** _____.
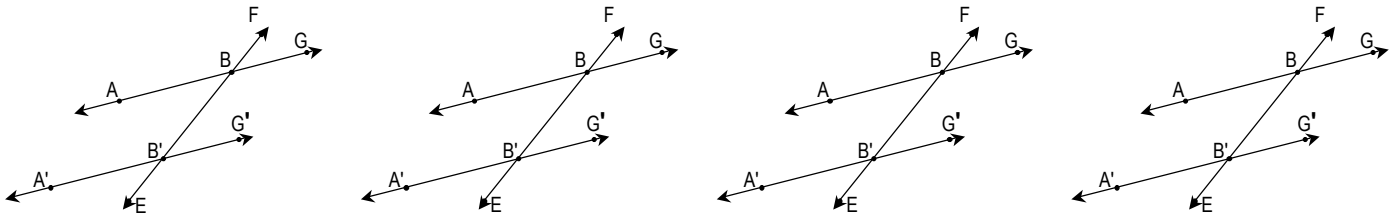
        *In each diagram, show a different pair of corresponding angles with congruence marks.   etc.
         *These pairs of angles are called **corresponding** angles because they are in the same relative location. These
        pairs of angles are congruent because each _____ angle maps to the _____ angle
        under translation and translation preserves _____.

    ☐ (d) Summarize the relationship between parallel lines and **corresponding** angles.
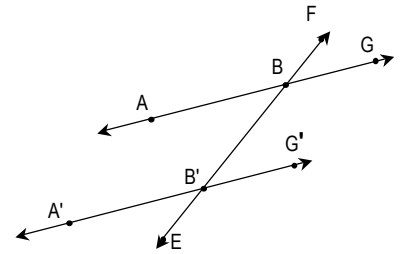   *Lines are _____ when **corresponding** angles are _____*
             AND . . .
            Corresponding *angles are _____ when lines are _____*

4.2

(5) ☐ In the diagram at right, $\overleftrightarrow{AG} \parallel \overleftrightarrow{A'G'}$. Provide a reason for each statement below.

    ∠FBA ≅ ∠GBB' because _____

   ∠GBB' ≅ ∠BB'A because _____

    ∠BB'A ≅ ∠G'B'E because _____

    Based on the statements above, ∠FBA ≅ ∠G'B'E because _____

    _____

    This angle relationship between ∠FBA and ∠G'B'E is called **alternate exterior** because both angles are

        inside/outside (circle one) the parallel lines and they are on the same side/opposite side (circle one) of the

        transversal. There is one other pair of **alternate exterior** angles. Find the two angles in the pair and

        complete the congruence statement with them: _____ ≅ _____

(6) ☐ In the diagram at right, $\overleftrightarrow{AG} \parallel \overleftrightarrow{A'G'}$. Provide a reason for each statement below.
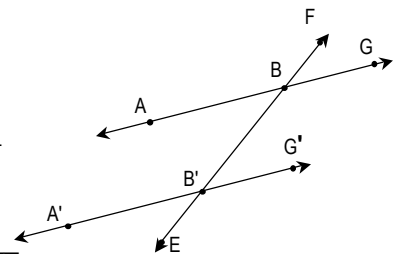
    ☐ m∠FBG + m∠GBB' = 180° because _____

    ☐ m∠FBG = m∠FB'G' because _____

   ☐ m∠FB'G' + m∠GBB' = 180° because _____

    _____

    This angle relationship is called **same side interior** because both angles are inside/outside (circle one) the

        parallel lines and they are on the same side/opposite side (circle one) of the **transversal**. There is one other

        pair of **same side interior** angles. Find the two angles in the pair and complete the statement with them:

        m_____ + m_____ = _____

(7) ☐ Summarize all of the angle relationships we have learned so far on the angles notes page (the back of this sheet).

(8) ☐ In the diagram at right, m∠a = 125°. Complete each statement below:
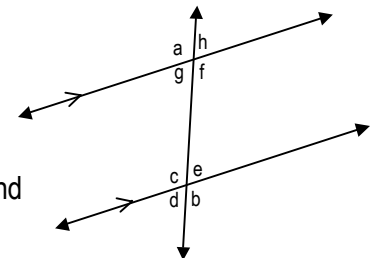
    (a) ☐ m∠f = 125° because ∠f is _____ to ∠a.

    (b) ☐ m∠b = 125° because ∠b is _____ to ∠a and

                                   _____ to ∠f.
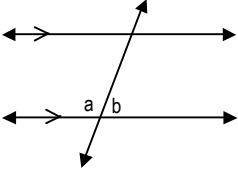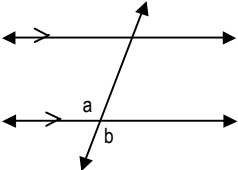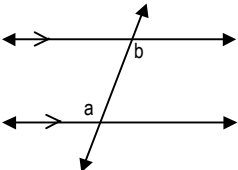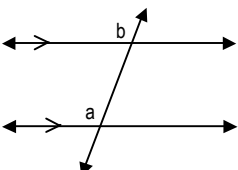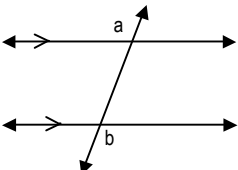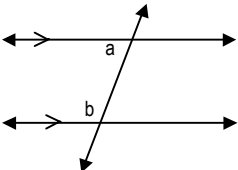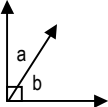
    (c) ☐ m∠c = 125° because ∠c is _____ to ∠a and

                                    _____ to ∠f and

                                    _____ to ∠b.

    (d) ☐ m∠g = 55° because ∠g is _____ with ∠a and.

                                      _____ to ∠c.

    (e) ☐ m∠h = 55° because ∠h is _____ to ∠g.

NOTICE: Reasons can ONLY include relationships to angles that are already known.

4.2 ANGLES NOTES PAGE

Diagram	Name	Description
	Name Equation	Description
	Name Equation	Description
	Name Equation	Description
	Name Equation	Description
	Name Equation	Description
	Name Equation	Description
	Name Equation	Description

4.2 Exit Ticket   Name_____Per_____

Sketch a pair of parallel lines and a transversal. Mark all congruent angles.

I will have the most difficulty remembering _____ **angles.**

I will remember them by _____

4.2 Exit Ticket   Name_____Per_____

Sketch a pair of parallel lines and a transversal. Mark all congruent angles.

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4.2 Exit Ticket   Name_____Per_____

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4.2 Exit Ticket   Name_____Per_____

Sketch a pair of parallel lines and a transversal. Mark all congruent angles.

I will have the most difficulty remembering _____ **angles.**

I will remember them by _____