Geometry Regents Lomac 2015-2016 **Date** 11/2 **due** 11/3

Angles Writing Proofs with Auxiliary Lines **3.6R**

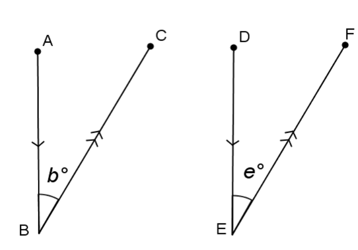
Name ____ **Per**______

LO: I can add auxiliary lines to diagrams and use angle relationships to prove statements.

☐ **DO NOW** On the back of this packet

☐ (1) transparencies, dry erase markers, erasers compass

Angles: Exterior angle theorem: Proof by constructing a parallel line.



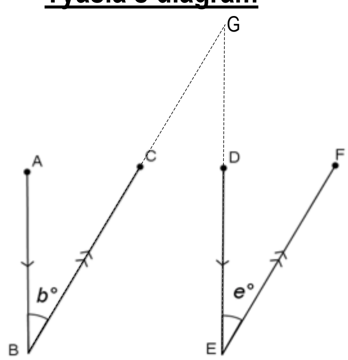
☐ Using the diagram at right, Tyasia and Taleak are proving that the measures of angles B and E are equal. Why do they need to extend lines or add auxiliary lines?

____

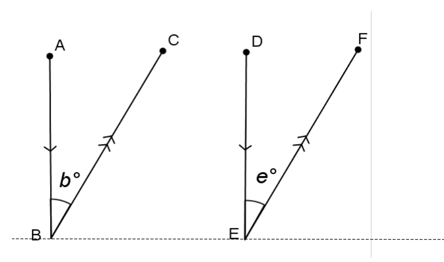
____

____

Tyasia's diagram



Taleak's diagram



☐ Describe Tyasia's additions to the diagram

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☐ Describe Taleak's additions to the diagram

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☐ Tyasia says she can use alternate interior angles to write her proof. Do you agree with her? Why or why not?

____

____

____

☐ Taleak says he can use corresponding angles to write his proof. Do you agree with him? Why or why not?

____

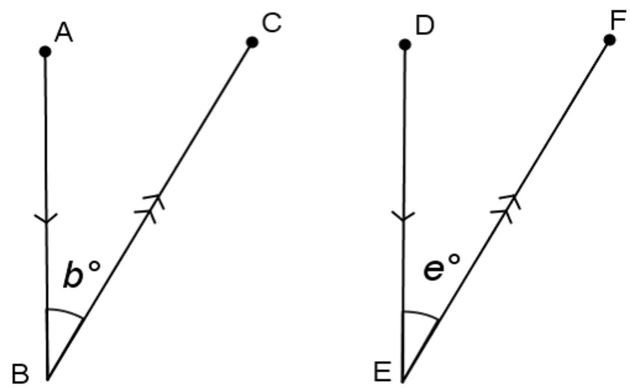
____

____

☐ (1) cont. transparencies, dry erase markers, erasers

Angles: Proving relationships

☐ Choose ONE of their drawings and prove that the measure of angle B is equal to the measure of angle E. Add letters to the diagram where needed to help you write the proof



I know that . . .	because . . .

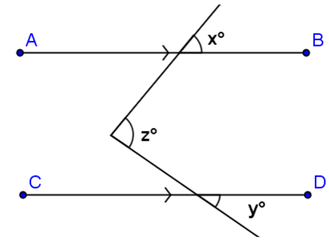
☐ (2) transparencies, dry erase markers, erasers

Angles: Proving relationships

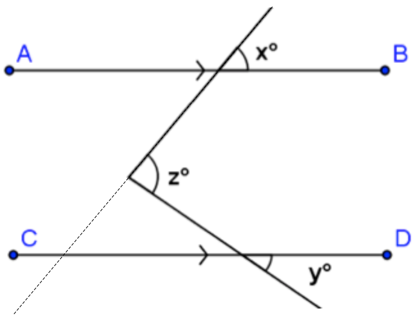
☐ The diagrams that Tyasia and Taleak drew could BOTH be used to write the proof. Like problem #1, there is more than one way to add to the diagram at right to prove the statement below.

Given: $\overline{AB} \parallel \overline{CD}$

Prove: $z = x + y$



The three diagrams below have different extensions or auxiliary lines drawn. Add the letters *a* and *b* to each diagram to help you write the proof.



☐ **THINK:** Angle z is an interior/exterior (circle one) angle of the triangle formed. An ______________________ angle of a triangle is equal to the sum of the _________________________ ______________________ angles. If we can get the remote interior angles to be the same measures as _____ and ______, then we can prove that $z = x + y$

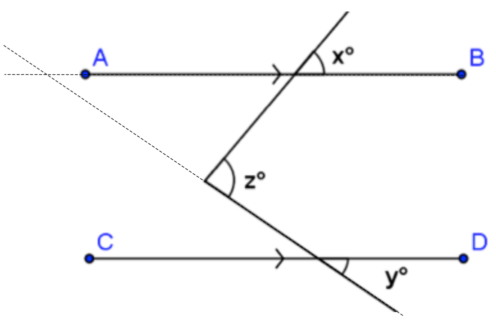
☐ **PROOF:**

(1) a = x because the angles are corresponding (add a to the diagram)

(2) b = y because they are vertical (add b to the diagram)

(3) _____ + _____ = z because of the ___________ ____________ thrm.

(4) _____ + _____ = z because equal values can be substituted.



☐ **THINK:** Angle z is an interior/exterior (circle one) angle of the triangle formed. An ______________________ angle of a triangle is equal to the sum of the _________________________ ______________________ angles. If we can get the remote interior angles to be the same measures as _____ and ______, then we can prove that $z = x + y$

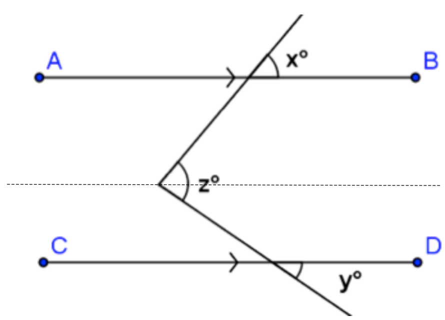
☐ **PROOF:**

(1) a = x because the angles are ______________________(add a to the diagram)

(2) b = y because they ___________________________ (add b to the diagram)

(3) _____ + _____ = z because of the _____________ ______________ theorem.

(4) _____ + _____ = z because equal values can be ___________________.



☐ **THINK:** Angle z is composed of _____ adjacent angles. If we can prove that one of the angles is congruent to _____ and the other is congruent to ______ then we can prove that $z = x + y$

☐ **PROOF:**

(1) a = x because the angles are ______________________(add a to the diagram)

(2) b = y because the angles are ______________________(add b to the diagram)

(3) _____ + _____ = z because the measure of an angle is equal to the sum of the ____________________ angles that make up the larger angle.

(4) _____ + _____ = z because____.

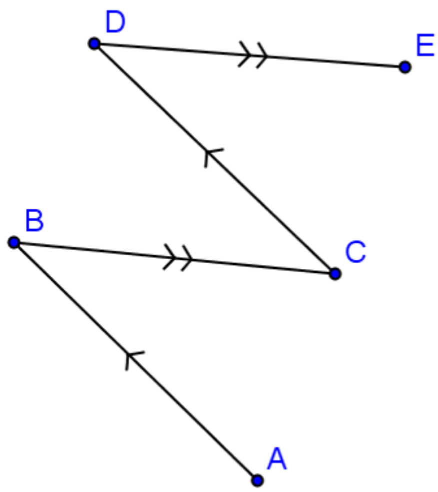
☐ (3) large dry erase problems

Angles: Proving Relationships

Prove the statement for each problem in this section. You may or may not need to draw an auxiliary line.

☐ (a) In the figure, $AB \parallel CD$ and $BC \parallel DE$.

Prove that $\angle ABC = \angle CDE$.

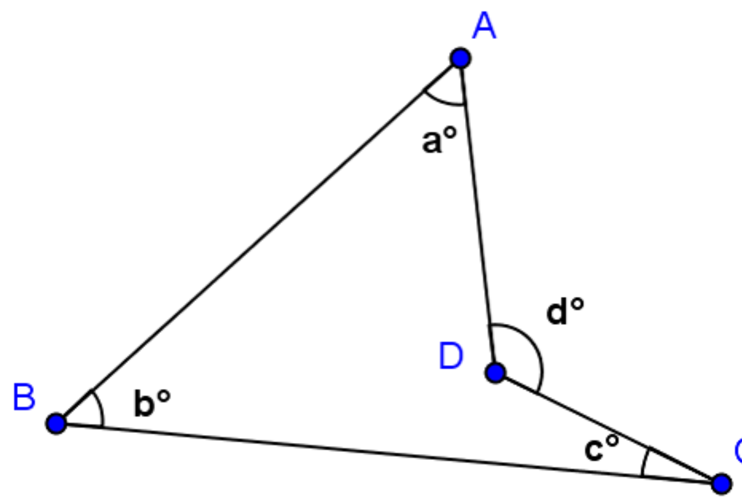


I know that . . .	because . . .

☐ (3) large dry erase problems

Angles: Proving Relationships

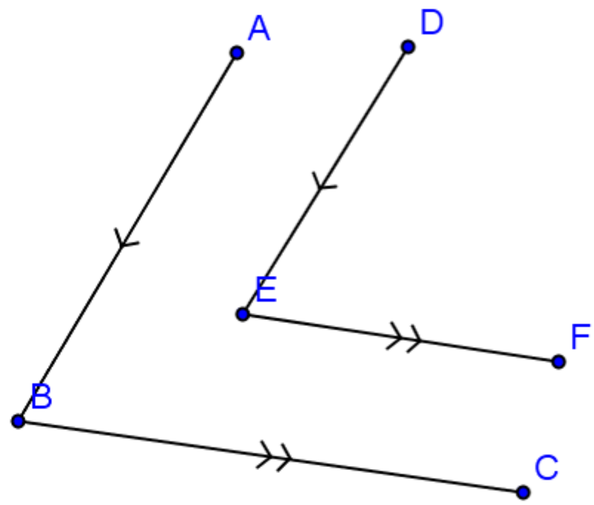
☐ (b) In the figure, prove that $d = a + b + c$.



I know that . . .	because . . .

☐ (3) cont. **Angles: Proving Relationships**

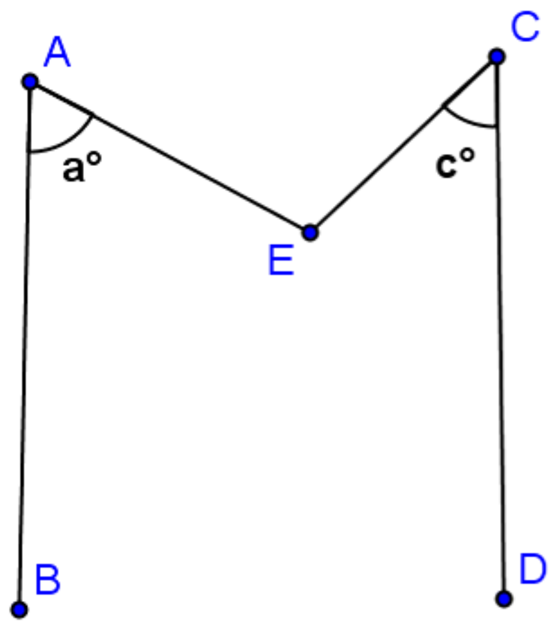
☐ (c) In the figure, $AB \parallel DE$ and $BC \parallel EF$. Prove that $\angle ABC = \angle DEF$.



I know that . . .	because . . .

☐ (3) **Angles: Proving Relationships**
cont.

☐ (d) In the figure, $AB \parallel CD$. Prove that $\angle AEC = a + c$



I know that . . .	because . . .

☐ (4) **Exit Ticket**

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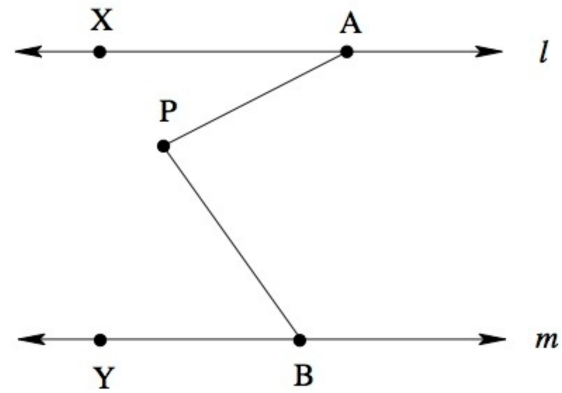
☐ (5) **Homework**

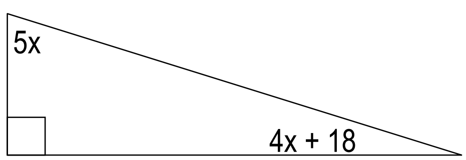
☐ (1) PROVE: ∠XAP + ∠YBP = ∠APB



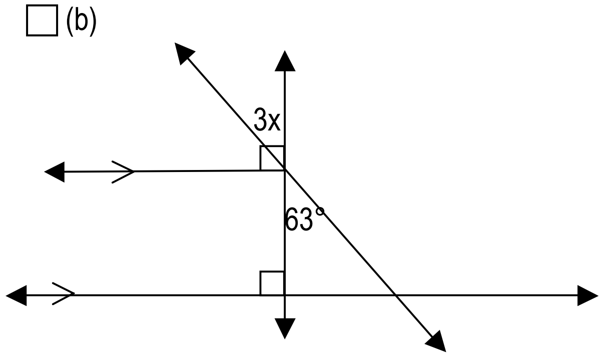
I know that . . .	because . . .

☐ (2) Find the measure of *x* in each diagram. State a reason for each step that you take.

☐ (a)

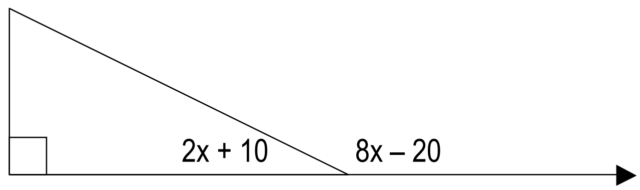


☐ (b)

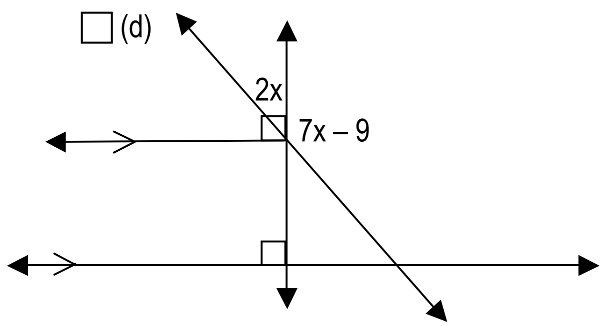


☐ (5) **Homework**
cont.

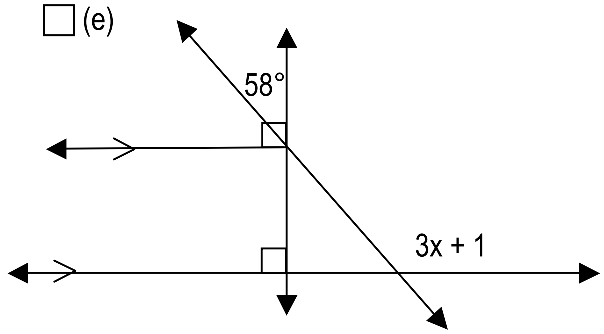
☐ (c)



☐ (d)



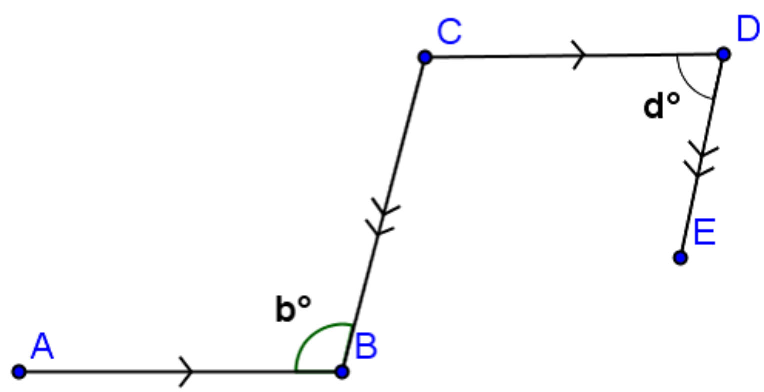
☐ (e)



Exit Ticket **Name**________________________________ **Date** ___________ **Per**______ **3.6R**

(1) The LO (Learning Outcomes) are written below your name on the front of this packet. Demonstrate your achievement of these outcomes by doing the following:

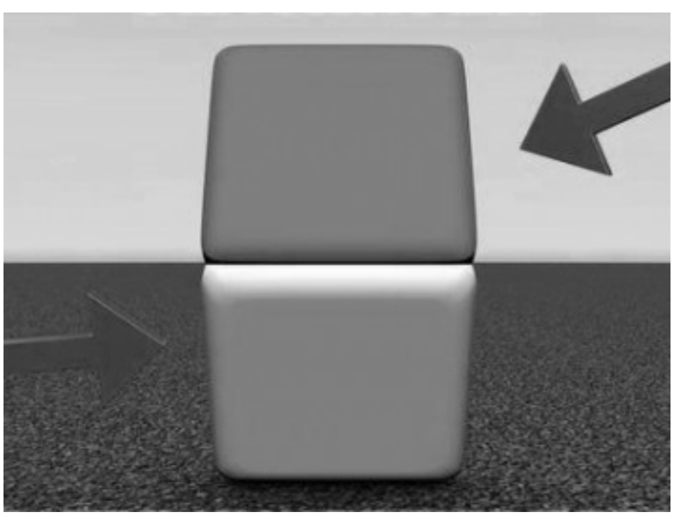
In the figure, $AB \parallel CD$ and $BC \parallel DE$. Prove that $b + d = 180$.



DO NOW Name________________________________ Date ___________ Per______ 3.6R

(1) Make 3 sketches: one that shows corresponding angles, one that shows alternate interior angles, and one that shows alternate exterior angles.

(2) Are the boxes below the same color?___________ Now put your finger across the middle. Did this change your answer?



What a difference a line can make.