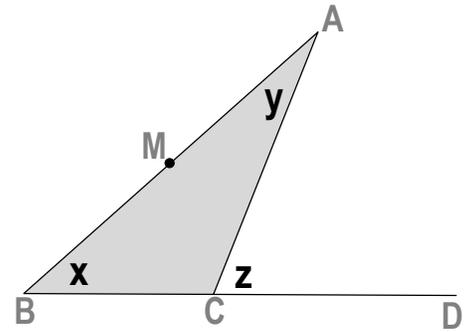**Name (print first and last)** _____ **Per**_____ **Date:** _11/21 due 11/25_
4.5 Angles: Writing Proof   **Geometry Regents 2013-2014 Ms. Lomac**
SLO: I can write proofs about angles.

(1) ☐ **Exterior angle theorem**: Proof by constructing a parallel line.

   ☐ (a) The **exterior angle theorem** states that

   $$m\angle z = m\angle\underline{\hspace{1cm}} + m\angle\underline{\hspace{1cm}}$$

   ☐ (b) Rotate $\angle B$ 180° around the midpoint of $\overline{AB}$.

   ☐ (c) m∠B = x, so m∠B' = _____ because _____

   ☐ (d) m∠B'AC = _____ + _____ because _____

   ☐ (e) $\overline{C'A}$ is _____ to $\overline{BC}$ because _____

   ☐ (f) m∠B'AC = m∠ACD because _____

   ☐ (g) x + y = z because _____

(2) ☐ **Exterior angle theorem**: Proof by angle relationship & algebra
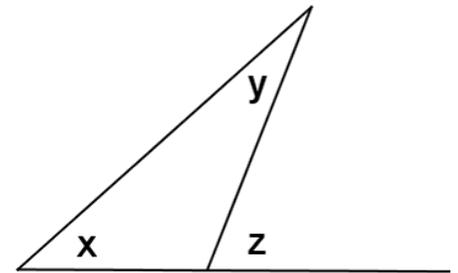
   ☐ (a) Add a w to the empty angle in the diagram

   ☐ (b) x + y + w = 180   because _____

   ☐ (c) z + w = 180   because _____

   ☐ (d) x + y + w = z + w   because _____

   ☐ (e) x + y = z   because _____

(3) ☐ When writing proofs, you can rely on **facts** that you know – facts about **angle relationships**, **transformations**,

parallel lines. You can add **auxiliary lines** or **letters** to angles or points of intersection. You can construct to help you see

relationships you might use in a proof. As you work through each proof in 4.5, refer to the notes pages on this activity and

on activity 4.2. Prove each statement below. (you may not need all of the lines provided for you) Do 6 of the 10 problems.
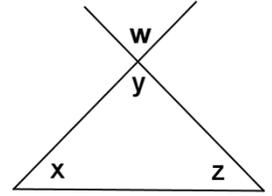
   ☐ (a) PROVE: *Vertical angles are equal.*   (suggestion: 2 linear pairs, substitution, and inverse operations)

   _____ and _____ are vertical angles

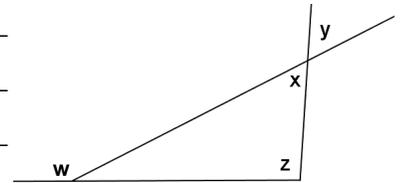   _____ because _____

   _____ because _____

   _____ because _____

   _____ because _____

   _____ because _____
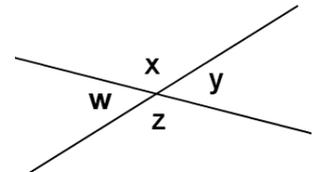
   _____ because _____

   _____ because _____

☐ (b) PROVE: $m\angle w + m\angle x + m\angle z = 180°$ (suggestions: vertical angles, triangle sum, substitution)

_____ because _____

_____ because _____

_____ because _____

_____ because _____

_____ because _____

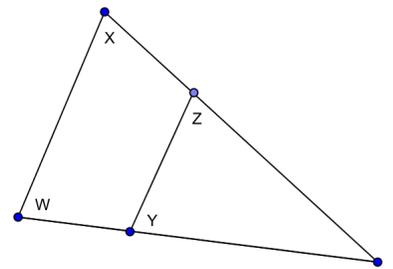_____ because _____

☐ (c) PROVE: $m\angle w = m\angle y + m\angle z$ (suggestions: vertical angles, exterior angle theorem, substitution)

_____ because _____

_____ because _____

_____ because _____

_____ because _____

_____ because _____
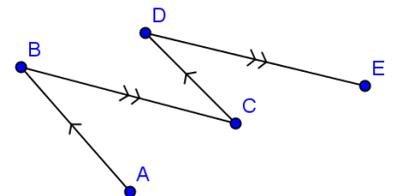
_____ because _____

☐ (d) PROVE: $m\angle y + m\angle z = m\angle w + m\angle x$ (suggestions: add a letter, triangle sum, substitution)
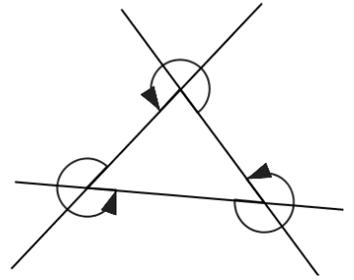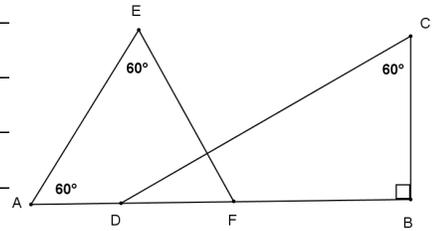
_____ because _____

_____ because _____

_____ because _____

_____ because _____

_____ because _____

_____ because _____

☐ (e) PROVE: $\angle ABC = \angle CDE$ (suggestions: note the pairs of parallel lines)

_____

_____
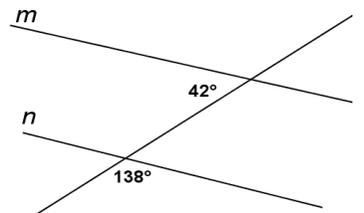
_____

_____

_____

_____

☐ (f) PROVE: *the sum of the marked angles is 900°*   (suggestions: add labels, triangle 180°, angles at a point)
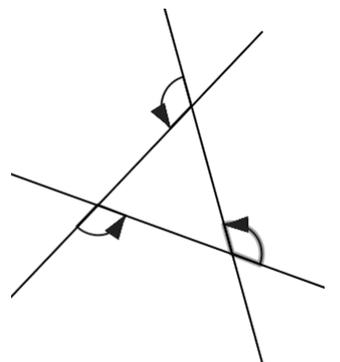
_____

_____

_____

_____

_____

☐ (g) PROVE: $\overline{DC} \perp \overline{EF}$ (suggestions: ⊥ means perpendicular means 90°, add letters, triangle 180°)

_____

_____

_____

_____

_____

_____

E
60°
C
60°
60°
A
D
F
B

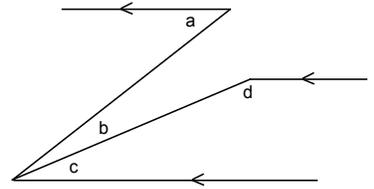☐ (h) PROVE: $m \parallel n$ (suggestions: add letters, corresp., linear pair, alt. int., vert., alt. ext., same side ext.)

_____

_____

_____

_____

_____

_____

m
42°
n
138°

☐ (i) PROVE: *the sum of the marked angles is 360°*   (suggestions: add letters, linear pair, triangle sum)

_____

_____

_____

_____

_____

☐ (j) PROVE: $\angle a + \angle d - \angle b = 180$ (suggestions: alt. int., same side int.,)

_____

_____

_____

_____

_____

_____

4.5 ANGLES NOTES PAGE 2

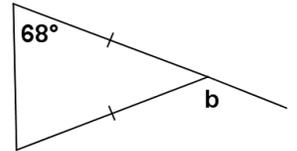| Diagram	Name	Description
(triangle with angles Z, X, Y)	Equation	
Diagram	Name	Description
(triangle with angle W at top, X, Y at base)	Equation	
Diagram	Name	Description
(isosceles triangle with base angles a, b)	Equation	
Diagram $x + y = z$ $a + b = z$ *therfore* $x + y = a + b$	Name	Description
	Equation	
Diagram $x + y = z$ $\underline{-y} \quad \underline{-y}$ $x = z - y$ OR with division, mult., add., sqare root, etc.	Name	Description
	Equation	

4.4 Exit Ticket   Name_____Per_____

Find the measure of angle b.

_____ because _____

_____ because _____

_____ because _____

_____ because _____

_____ because _____
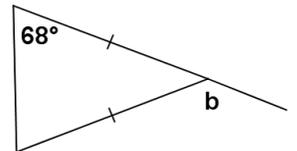
_____ because _____

68° b

4.4 Exit Ticket   Name_____Per_____

Find the measure of angle b.

_____ because _____

_____ because _____

_____ because _____

_____ because _____

_____ because _____

_____ because _____

68° b

4.4 Exit Ticket   Name_____Per_____

Find the measure of angle b.

_____ because _____

_____ because _____

_____ because _____

_____ because _____

_____ because _____

_____ because _____

68° b

4.4 Exit Ticket   Name_____Per_____

Find the measure of angle b.

_____ because _____

_____ because _____

_____ because _____

_____ because _____

_____ because _____

_____ because _____

68° b