☐ **DO NOW – Geometry Regents Lomac 2014-2015** **Date** ____. **due** ____. **Angles: Writing Proofs** | **3.5**

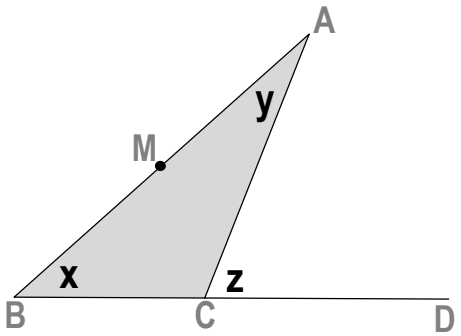
(DN) Draw line *m* and construct lines *p* and *q* so that they are both perpendicular to line *m*.

IMPRESS ME: How can you use your compass with your construction to make a square? Explain or execute.

Name _____**Per**_____

LO: I can use angle relationships to prove statements.

☐ (1) transparencies, dry erase markers, erasers compass **Angles: Exterior angle theorem:** Proof by constructing a parallel line.



☐ (a) The **exterior angle theorem** states that (see N12)

z = _____ + _____

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

☐ (c) I know that m∠ABC = x because it is ***given*** in the diagram.

Therefore, I know that m∠A'B'C' = _____ because _____

_____

☐ (d) I know that m∠C'AC = _____ + _____ because _____

_____

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

_____

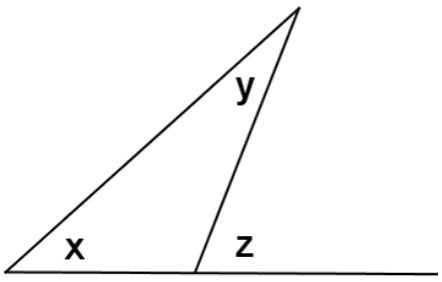
☐ (f) I know that m∠C'AC = m∠ACD because _____

_____

☐ (g) I know that x + y = z because _____

_____

☐ (2) transparencies, dry erase markers, erasers **Angles: Exterior angle theorem**: Proof by angle relationship & algebra



☐ (a) Add a w to the empty angle in the diagram

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

☐ (c) I know that z + w = 180 because _____

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

☐ (e) I know that x + y = z because _____

☐ (3) transparencies, dry erase markers, erasers

Angles: Proving relationships

☐ 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 this lesson, refer to the notes pages N11 and N12. 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)

(1) I know that _____ and _____ are vertical angles

because _____

(2) I know that _____

because _____

(3) I know that _____

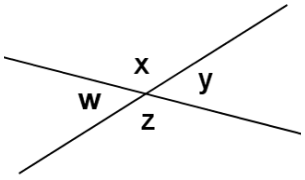
because _____

(4) I know that _____

because _____

(5) I know that _____

because _____



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

(1) I know that _____

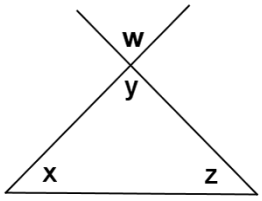
because _____

(2) I know that _____

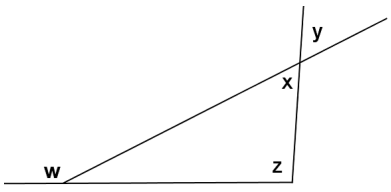
because _____

(3) I know that _____

because _____



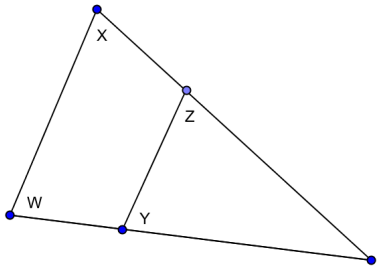
☐ (c) PROVE: $w = y + z$ (suggestions: vertical angles, exterior angle theorem, substitution)



I know that . . .	**because . . .**

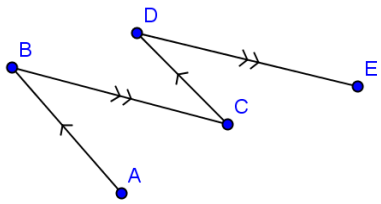
☐ (3) cont. **Angles: Rotations and proving the**

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



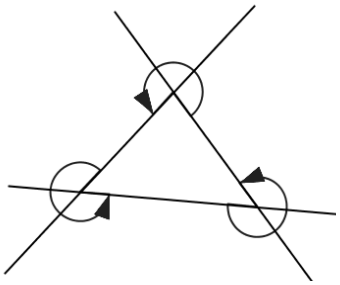
I know that . . .	because . . .

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



I know that . . .	because . . .

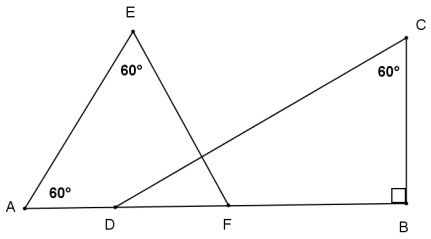
☐ (f) PROVE: *the sum of the marked angles is 900°* (suggestions: add labels, triangle 180°, angles at a point)



I know that . . .	because . . .

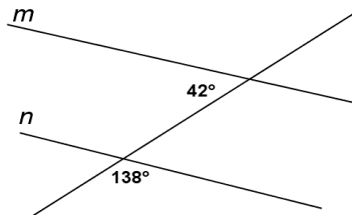
☐ (3) cont. **Angles: Rotations and proving the**

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



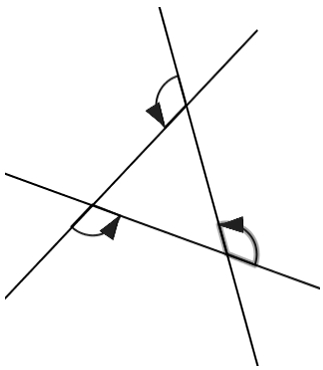
I know that . . .	because . . .

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



I know that . . .	because . . .

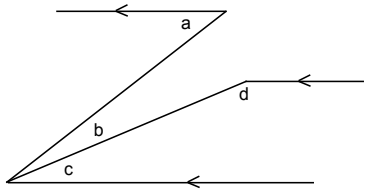
☐ (i) PROVE: *the sum of the marked angles is 360°* (suggestions: add letters, linear pair, triangle sum)



I know that . . .	because . . .

☐ (3) cont. **Angles: Rotations and proving the**

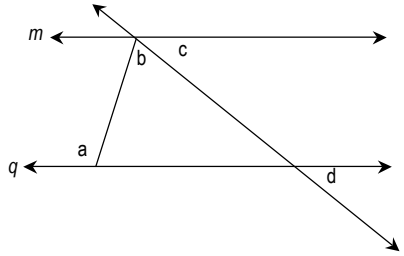
☐ (j) PROVE: $a + d - b = 180°$ (suggestions: alt. int., same side int.,)



I know that . . .	because . . .

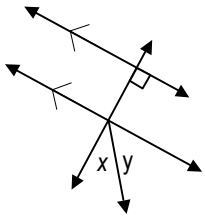
☐ (4) **Exit Ticket**

Given that q || m , prove a = b + d.



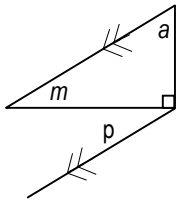
☐ (5) **Homework** You may need to add letters to the diagrams to complete your proof.

☐ (1) PROVE: $x + y = 90°$



I know that . . .	because . . .

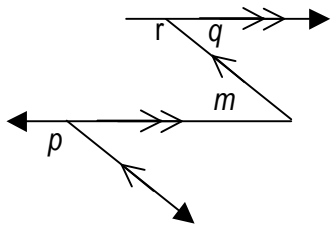
☐ (2) PROVE: $a + p = 90°$



I know that . . .	because . . .

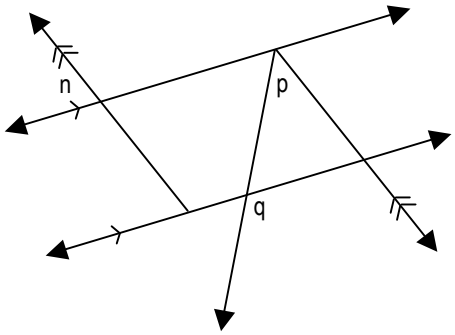
☐ (4) **Homework**
cont.

☐ (3) PROVE: p + m = 180°



I know that . . .	because . . .

☐ (4) PROVE: n + p = q (CHALLENGE!!)



I know that . . .	because . . .