2.5 Start Thinking

Draw a rectangle and then draw one diagonal of the rectangle. The formula for the area of a triangle is $A = \frac{1}{2}bh$, where b represents the base and h represents the height of the triangle. The formula for the area of any quadrilateral is $A = bh$.

Use the information above to explain why the formula for the area of a triangle is related to the area of a rectangle.

2.5 Warm Up

Find the complement and the supplement of the angle measure.

1. 59°

2. 20°

3. 53°

4. 22.6°

5. 28°

6. 74°

2.5 Cumulative Review Warm Up

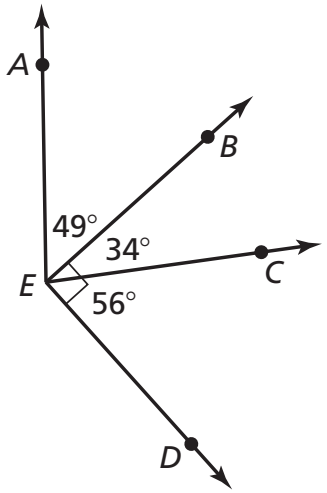
Use the figure.

1. Name a pair of adjacent complementary angles.

2. Find $m\angle AEC$.

3. Find $m\angle AED$.

4. Find $m\angle BED$.



Name _____ Date _____

2.5 Practice A

In Exercises 1 and 2, name the property that the statement illustrates.

1. If $\overline{PQ} \cong \overline{RS}$, then $\overline{RS} \cong \overline{PQ}$.

2. $\angle A \cong \angle A$

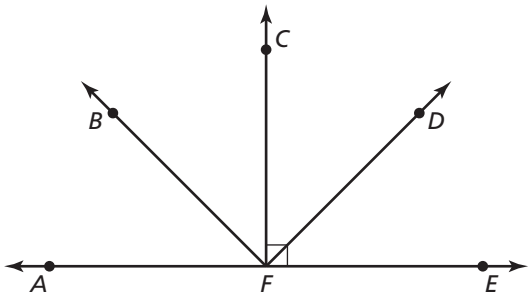
In Exercises 3 and 4, write a two-column proof for this property.

3. Symmetric Property of Angle Congruence

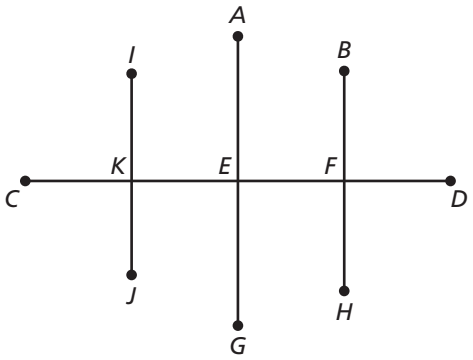
4. Reflexive Property of Segment Congruence

In Exercises 5 and 6, write a two-column proof.

5. Given $\overleftrightarrow{BF}$ bisects $\angle AFC$ and $\angle CFD \cong \angle BFC$. Prove $\angle AFB \cong \angle CFD$.



6. Given $\overline{AG}$ bisects $\overline{CD}$, $\overline{IJ}$ bisects $\overline{CE}$, and $\overline{BH}$ bisects $\overline{ED}$. Prove $\overline{KE} \cong \overline{FD}$.



Name_____ Date _____

2.5 Practice B

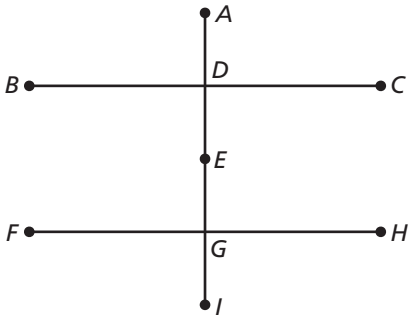
In Exercises 1 and 2, write a two-column proof for this property.

1. Symmetric Property of Segment Congruence

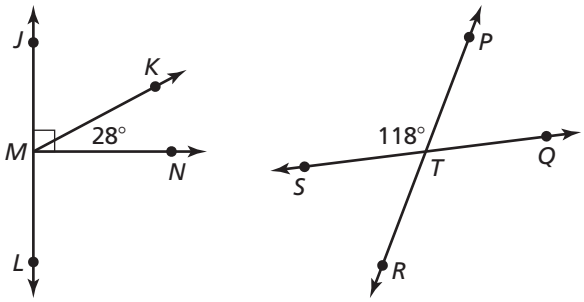
2. Transitive Property of Angle Congruence

In Exercises 3–5, write a two-column proof.

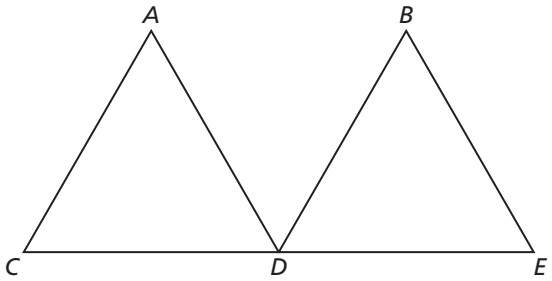
3. Given E bisects $\overline{AI}$, $\overline{BC}$ bisects $\overline{AE}$, and $\overline{FH}$ bisects $\overline{EI}$. Prove $\overline{AD} \cong \overline{EG}$.



4. Given $m\angle KMN = 28°$ and $m\angle PTS = 118°$. Prove $\angle JMK \cong \angle STR$.



5. Given $\angle ADC \cong \angle BDE$. Prove $\angle ADE \cong \angle BDC$.



Name _____ Date _____

2.5 Enrichment and Extension

Proving Statements About Segments and Angles

In Exercises 1–3, suppose point T is the midpoint of $\overline{RS}$ and point W is the midpoint of $\overline{RT}$. If $\overline{TS}$ has length $TS = z$, find the following expressions and write a two-column proof justifying your answer.

1. RT in terms of z

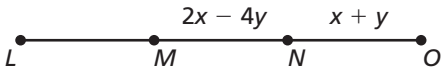
2. RS in terms of z

3. RW in terms of z

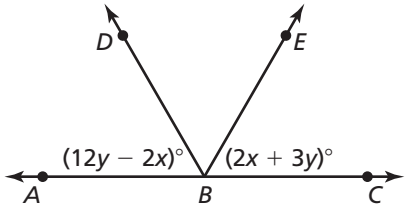
4. Suppose M is the midpoint of $\overline{AB}$, P is the midpoint of $\overline{AM}$, and Q is the midpoint of $\overline{PM}$. If a and b are the coordinates of points A and B on a number line, find the coordinates of points P and Q in terms of a and b.

5. Solve for x and y using the given information.

a. Given: $\overline{LM} \cong \overline{MN}$, $\overline{NO} \cong \overline{MN}$, $LM = 12$



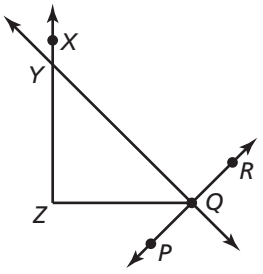
b. Given: $\angle ABD \cong \angle CBE$, $\angle DBE \cong \angle CBE$, $m\angle DBE = 60°$



6. Write a two-column proof.

Given: $m\angle ZYQ = 45°$
$m\angle ZQP = 45°$

Prove: $\angle ZQR \cong \angle XYQ$



Name_____ Date _____

2.5 Puzzle Time

Which Month Has Twenty-Eight Days?

Circle the letter of each correct answer in the boxes below. The circled letters will spell out the answer to the riddle.

Complete each sentence with the correct answer.

1. A _____ has numbered statements and corresponding reasons that show an argument in a logical order.
2. A _____ is a statement that can be proven.
3. A _____ is a logical argument that uses deductive reasoning to show that a statement is true.

Name the property that is illustrated. (A) Addition, (B) Transitive, (C) Inverse, (D) Symmetric, (E) Distributive, (F) Reflexive, (G) Multiplication

4. If $\angle G \cong \angle H$, then $\angle H \cong \angle G$.
5. If $AB = CD$ and $CD = XY$, then $AB = XY$.
6. $\angle A \cong \angle A$

Complete the proof using the correct reason. (1) Congruent segments, (2) Given, (3) Congruent angles, (4) Symmetric, (5) Reflexive

Given: $\overline{AB} \cong \overline{CD}$ **Prove:** $\overline{CD} \cong \overline{AB}$

STATEMENTS	REASONS
$\overline{AB} \cong \overline{CD}$	7. _____
$AB = CD$	8. _____
$CD = AB$	9. _____
$\overline{CD} \cong \overline{AB}$	Definition of congruent segments

R	T	K	N	H	F	E	M	Y	B
E	1	0	A	two-column proof	inductive	proof	list	B	3
G	**A**	**U**	**L**	**P**	**L**	**I**	**L**	**D**	**O**
C	4	G	F	deductive	5	$\frac{1}{4}$	theorem	2	D