3-2 Properties of Parallel Lines

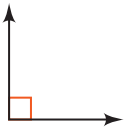
Vocabulary

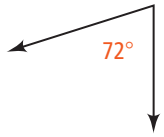
Review

1. Circle the symbol for *congruent*. ≅ = ∥

Identify each angle below as *acute, obtuse,* or *right*.

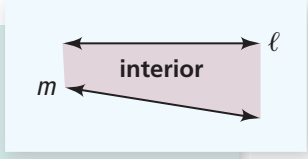
2. 

3. 

4. 

Vocabulary Builder

interior (noun) **in TEER ee ur**



Main Idea: The **interior** is the inside of a figure.

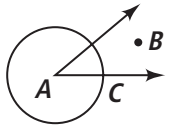
Related Words: inside (noun), exterior (noun, antonym)

Definition: The **interior** of a pair of lines is the region between the two lines.

Example: A painter uses **interior** paint for the inside of a house.

Use Your Vocabulary

Use the diagram at the right for Exercises 5 and 6. Underline the correct point to complete each sentence.



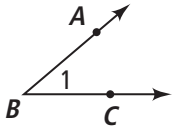
5. The *interior* of the circle contains point *A* / *B* / *C*.

6. The *interior* of the angle contains point *A* / *B* / *C*.

7. Underline the correct word to complete the sentence.

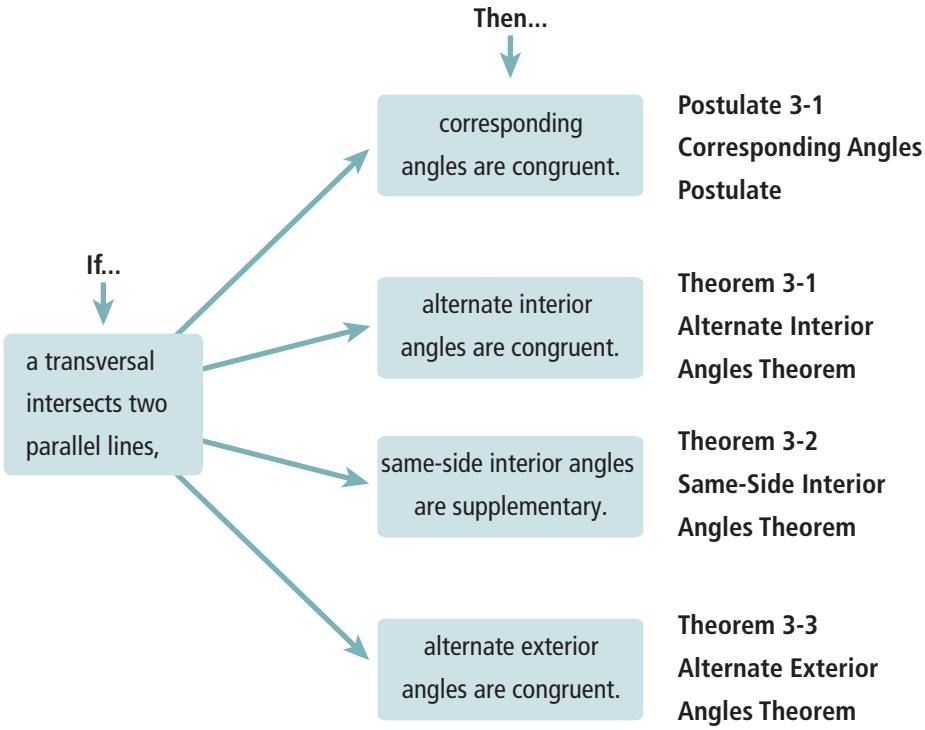
The endpoint of an *angle* is called its ray / vertex.

8. Write two other names for $\angle ABC$ in the diagram at the right.

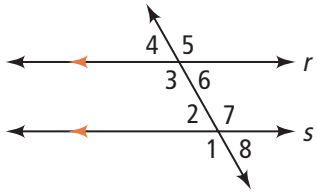


take note

Postulate 3-1, Theorems 3-1, 3-2, 3-3



Use the graphic organizer and the diagram to find each congruent angle.



9. Postulate 3-1

$\angle 3 \cong$ ____

10. Theorem 3-1

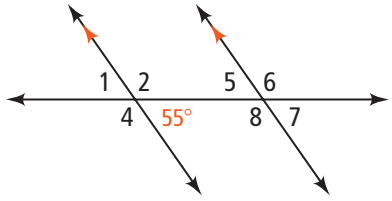
$\angle 3 \cong$ ____

11. Theorem 3-3

$\angle 1 \cong$ ____

Problem 1 Identifying Congruent Angles

Got It? Reasoning **One way to justify $m\angle 5 = 55$ is shown below. Can you find another way to justify $m\angle 5 = 55$? Explain.**



$m\angle 1 = 55$ by the Vertical Angles Theorem.

$m\angle 5 = 55$ by the Corresponding Angles Postulate because $\angle 1$ and $\angle 5$ are corresponding angles.

12. Write a reason for each statement.

$m\angle 7 = 55$ ____

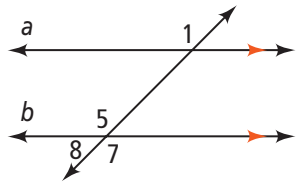
$m\angle 5 = m\angle 7$ ____

$m\angle 5 = 55$ ____

Problem 2 Proving an Angle Relationship

Got It? Given: $a \parallel b$

Prove: $\angle 1 \cong \angle 7$



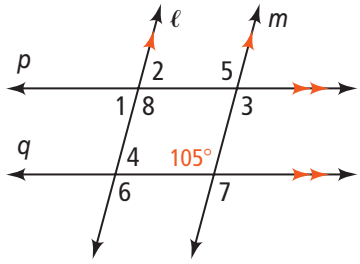
13. Use the reasons at the right to write each step of the proof.

Statements	Reasons
1)	1) Given
2)	2) If lines are $\parallel$, then corresp. angles are $\cong$.
3)	3) Congruent angles have equal measure.
4)	4) Vertical angles are congruent.
5)	5) Congruent angles have equal measure.
6)	6) Transitive Property of $\cong$
7)	7) Angles with equal measure are $\cong$.

Problem 3 Finding Measures of Angles

Got It? Find the measure of $\angle 1$. Justify your answer.

14. There are two sets of parallel lines. Each parallel line also acts as a _?_.

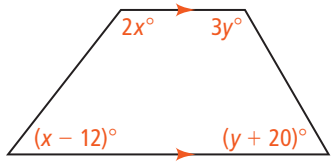


15. The steps to find $m\angle 1$ are given below. Justify each step.

Statements	Reasons
1) $\angle 1 \cong \angle 4$	1)
2) $m\angle 1 = m\angle 4$	2)
3) $\angle 4$ and $\angle 6$ are supplementary.	3)
4) $m\angle 4 + m\angle 6 = 180$	4)
5) $m\angle 1 + m\angle 6 = 180$	5)
6) $m\angle 5 = 105$	6)
7) $m\angle 6 = 105$	7)
8) $m\angle 1 + 105 = 180$	8)
9) $m\angle 1 = 75$	9)

Problem 4 Using Algebra to Find an Angle Measure

Got It? **In the figure at the right, what are the values of x and y?**



16. The bases of a trapezoid are parallel / perpendicular .

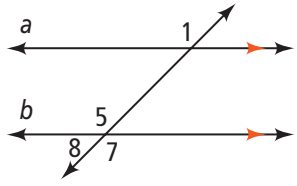
17. Use the Same-Side Interior Angles Theorem to complete each statement.

$2x +$ ____ $= 180$ $3y +$ ____ $= 180$

18. Solve each equation.

Lesson Check • Do you UNDERSTAND?

In the diagram at the right, ∠1 and ∠8 are supplementary. What is a good name for this pair of angles? Explain.



19. Circle the best name for lines a and b.

parallel	perpendicular	skew	transversals

20. Circle the best name from the list below for ∠1 and ∠8.

alternate	congruent	corresponding	same-side

21. Circle the best name from the list below for ∠1 and ∠8.

exterior	interior

22. Use your answers to Exercises 20 and 21 to write a name for ∠1 and ∠8.

_____

Math Success

Check off the vocabulary words that you understand.

☐ alternate interior angles ☐ alternate exterior angles

Rate how well you can *prove angle relationships*.

Need to review 0 2 4 6 8 10 Now I get it!