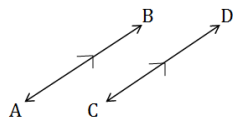


Chapter 2 Properties of Angles and Triangles

Sec 2.1 and 2.2: Exploring Parallel Lines

- Parallel lines – lines on the same flat surface (plane) that do not intersect
- the symbol for parallel lines is \rightarrow or \Rightarrow

If we have



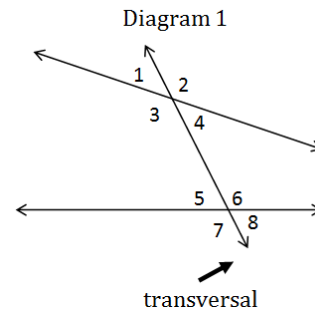
we are told that line AB, or \overline{AB} , is parallel to line CD, or \overline{CD} .

We can mathematically write this sentence as: $\overline{AB} \parallel \overline{CD}$

Where do we see parallel lines in the real world?

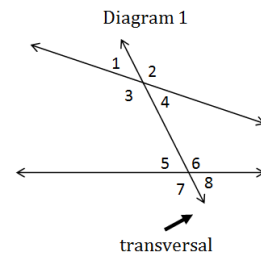
When 2 lines are crossed by a third line (transversal), eight angles are formed:

Transversal – a line that intersects two or more lines at distinct points. The lines may or may not be parallel.



Worksheet

Terms:



Exterior angles

any angles formed by a transversal and two lines that lie outside the lines.

$\angle 1$, $\angle 2$, $\angle 7$ and $\angle 8$

Interior angles

any angles formed by a transversal and two lines that lie inside the lines.

$\angle 3$, $\angle 4$, $\angle 5$ and $\angle 6$

Corresponding Angles

one interior angle and one exterior angle that are on the same side of the transversal but are non-adjacent.

$\angle 1$ and $\angle 5$
 $\angle 2$ and $\angle 6$
 $\angle 3$ and $\angle 7$
 $\angle 4$ and $\angle 8$

Review:

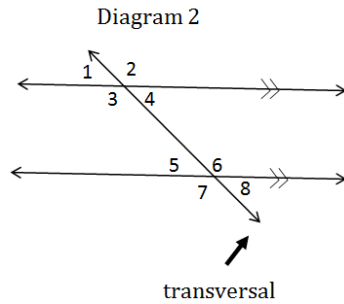
supplementary angles

complementary angles

vertically opposite angles

worksheet

In Diagram 2, there are special relationships that exist between the angles created **when the lines are parallel:**



Alternate Interior Angles are EQUAL

two non-adjacent interior angles on the opposite sides of the transversal.
(look for the "Z" shape)

$$\angle 3 = \angle 6$$

$$\angle 4 = \angle 5$$

Alternate Exterior Angles are EQUAL

two exterior angles formed between two lines and a transversal, on opposite sides of the transversal.

$$\angle 1 = \angle 8$$

$$\angle 2 = \angle 7$$

Corresponding Angles are EQUAL

one interior angle and one exterior angle that are non-adjacent and on the same side of a transversal.
(look for the "F" shape)

$$\angle 1 = \angle 5$$

$$\angle 2 = \angle 6$$

$$\angle 3 = \angle 7$$

$$\angle 4 = \angle 8$$

Same Side Interior Angles are SUPPLEMENTARY

two interior angles that lie on the same side of the transversal.
(look for a "C" shape)

$$\angle 3 + \angle 5 = 180^\circ$$

$$\angle 4 + \angle 6 = 180^\circ$$

If two lines are parallel when crossed by a transversal

Then:

The converse of these statements is also true.

Converse means a statement that is formed by switching the premise and conclusion of another statement.

If a transversal intersects a pair of lines creating:

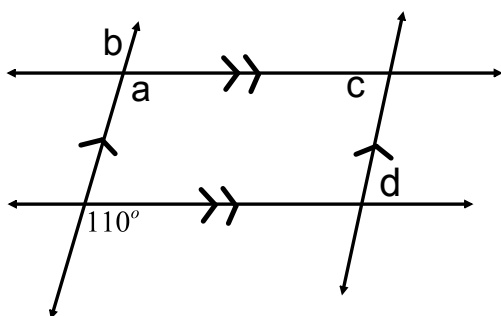
Then the lines are parallel.

To prove lines are parallel only one of the above conditions needs to be true.

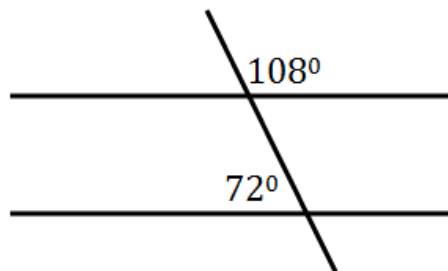
Assign

p. 72 #5 p.78 – 81 #1, 2, 4, 8, 10, 15

Example : Determine the measures of a, b c, and d.



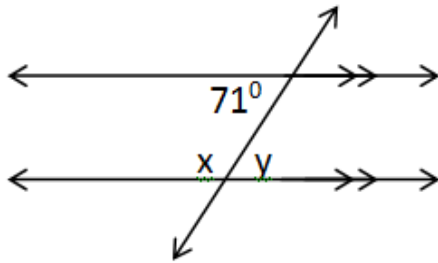
Example: Are these lines parallel? Explain.



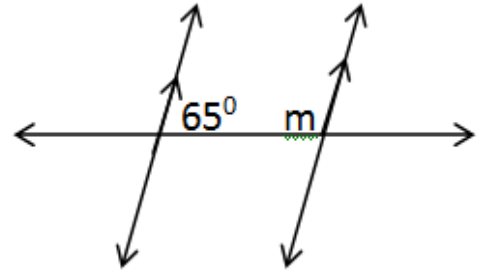
Missing Angles and Parallel Lines Worksheet

1. Find the missing measure of each identified angle

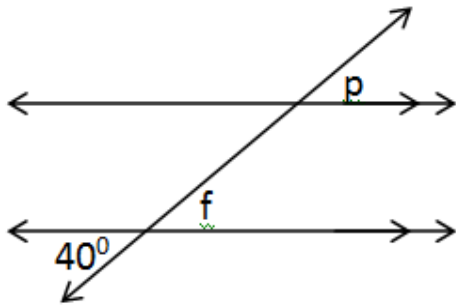
a).



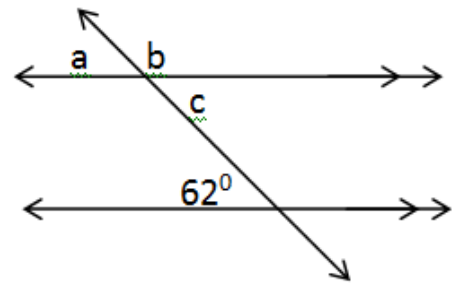
b).



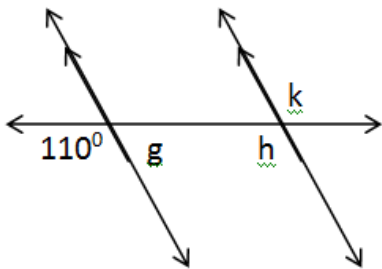
c).



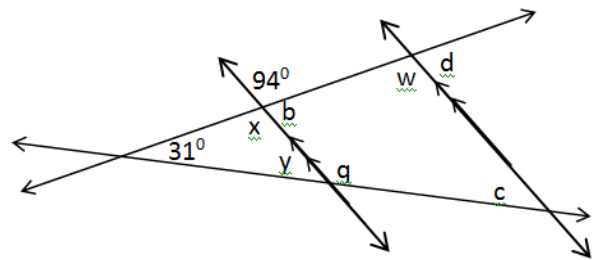
d).



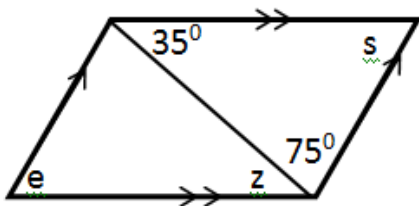
e).



f).



g).

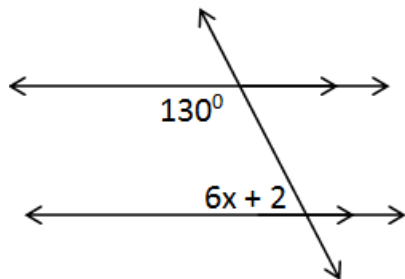


h).

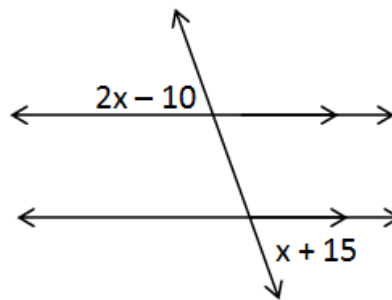


CHALLENGE

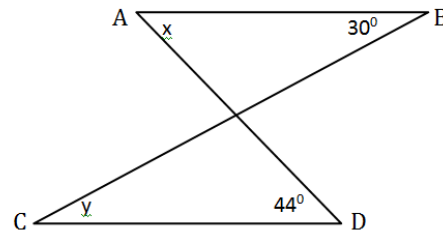
i). What is the value of x ?



j). What is the value of the missing angles?

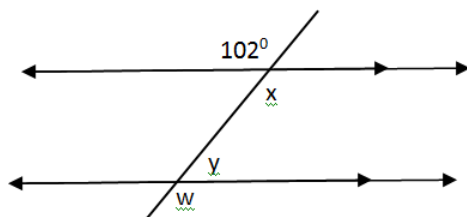


2. What are the values of x and y in the diagram below to ensure $AB \parallel CD$? How do you know?

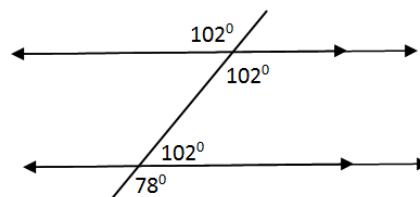


3. A question on a test was **Find the missing angle measures**. One student in the class had the following answer. Identify and correct any errors.

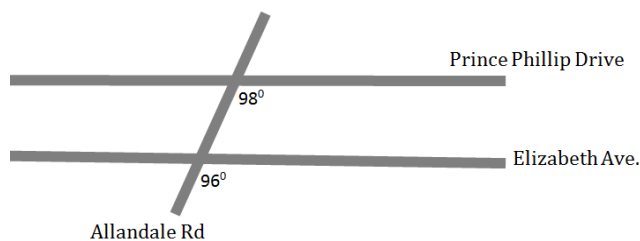
Test Question



Student's Answer

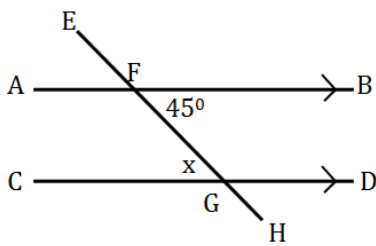


4. Suppose Prince Phillip Drive and Elizabeth Avenue follow a straight line path and intersect Allandale Road at angles of 98° and 96° as shown in the map below. If the streets were to continue in a straight line, would their paths ever cross? Explain your reasoning.



Example 5: Identify and correct any errors present in this example.

Determine the value of x.



Statement	Reason
$\angle BFG = 45^\circ$	Given
$\angle BFG = \angle FGD$	Same side interior angles are equal.
$\angle FGD + \angle FGC = 180^\circ$	Supplementary angles
$\angle FGC = 180^\circ - \angle FGD$ $\angle FGC = 180^\circ - 45^\circ$ $= 135^\circ$	Subtraction Property

Assign p.78 – 81 # 12, 16, 18

Attachments

PM11-2s1.gsp