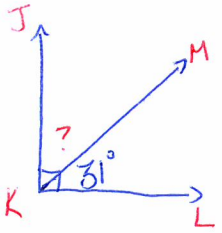
2.1 Exploring Parallel Lines and 2.2 Angles formed by Parallel Lines(Concept #17)

Supplementary Angles: Two angles that add up to 180° Note: A straight line is 180°

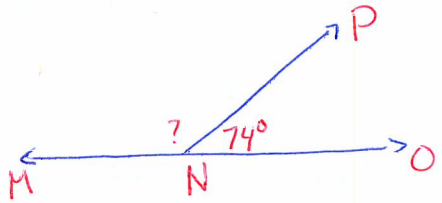
Complimentary Angles: Two angles that add up to 90°

Examples:

1) 

$\angle MKJ = 90 - 31$

$\angle MKJ = 59°$

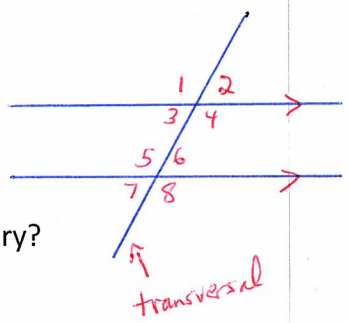
2) 

$\angle MNP = 180 - 74$

$= 106°$

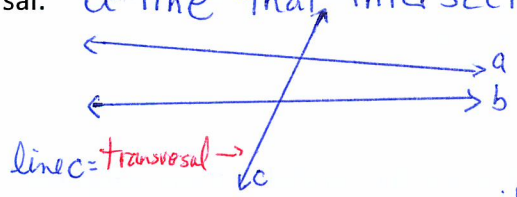
Have students: - Draw 2 parallel lines. "How do you know they are parallel?"

- Draw a line crossing both parallel lines (transversal)
- Label all angles 1-8
- "What angles are the same? What angles are supplementary?
- Make some conjectures about these angles



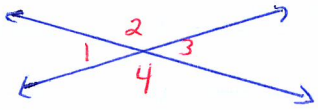
Definitions:

1) Transversal: a line that intersects two or more other lines



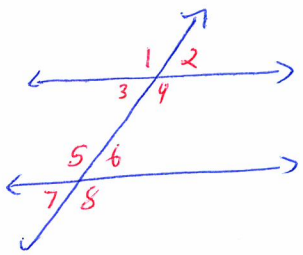
2) Vertically Opposite Angles : occur opposite each other at an intersecting point

Note: Vertically opposite angles are equal



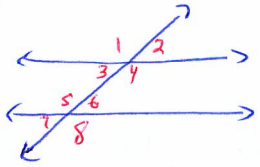
$\angle 1 \cong \angle 3$
$\angle 2 \cong \angle 4$
} Vertically opposite angles

3) Interior Angles: the angles found along the sides of the transversal and between the two lines



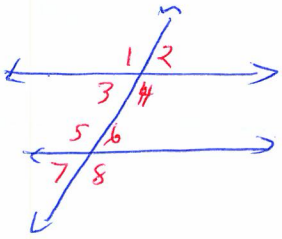
$\angle 3, \angle 4, \angle 5, \angle 6$ are interior angles

4) Exterior Angles: the angles formed along the sides of the transversal and above and below the lines



∠1 ; ∠2, ; ∠7, ; 8 are exterior angles

5) Corresponding Angles: Angles that occur in the same corner between the transversal and any of the lines it passes through



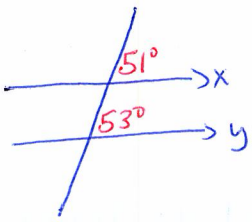
∠1 ; ∠5
∠2 ; 6
∠3 ; ∠7
∠4 ; 8
} Corresponding angles

FACTS: 1) When a transversal intersects a pair of parallel lines corresponding angles are equal

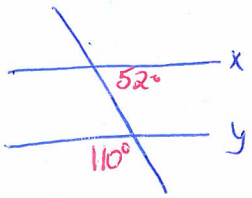
2) Converse of Fact 1: When a transversal intersects a pair of lines creating equal corresponding angles , the two lines are parallel.
3) Vertically Opposite angles are always equal
4) When a transversal intersects a pair of nonparallel lines the corresponding angles are not equal (and vice versa)
5) When a transversal intersects two parallel lines the following statements are true:
   a) Alternate interior angles are equal
   b) Same side Interior Angles are supplementary (add up to 180)
   c) Alternate Exterior Angles are equal

Example1: Based on the given info are lines x and y parallel? Why or why not?

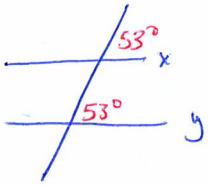
a)



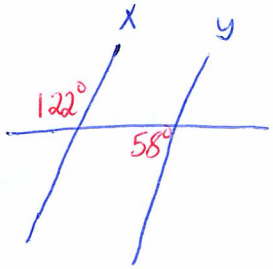
B)



c)

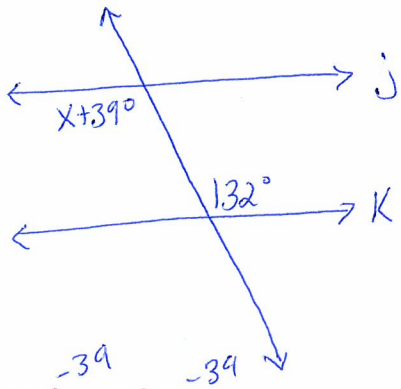


d)



Example 2: Find the value of x that makes j // k

a)

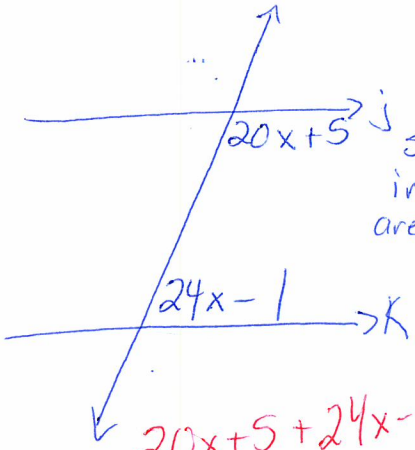


Alternate interior angles are equal

$x+39 = 132$

$-39 \quad -39$

$x = 93$



same side interior angles are supplementary

$20x+5+24x-1 = 180$

$44x+4 = 180$ (−4 −4)

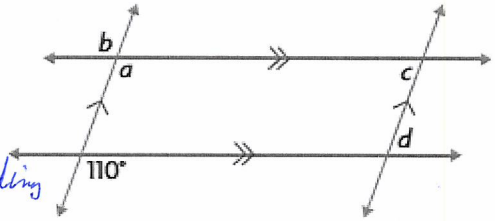
$\frac{44x}{44} = \frac{176}{44}$

$x = 4$

Example 3:

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

And explain your reasoning.



$\angle a = 110°$ because it is corresponding to 110°

$\angle b = \angle a$

$\angle b = 110°$ vertically opposite angles are equal

$\angle C = 180 - \angle a$ same side interior angles are supplementary

$\angle C = 180 - 110$

$\angle C = 70°$

$\angle d = \angle a$ alternate interior angles are equal

$\angle d = 70°$

Pg 72 #5 Pg 78 #1-4, 20 and Handout