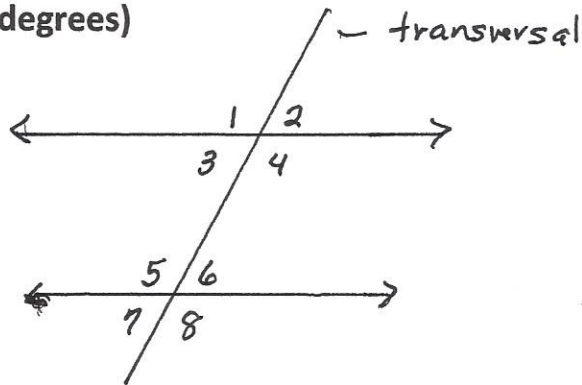


Parallel lines cut by a transversal:

Theorems:

- When lines are parallel, corresponding angles are equal
- When lines are parallel, alternate interior angles are equal
- When lines are parallel, alternate exterior angles are equal
- When lines are parallel, same-side interior angles are supplementary (add to 180 degrees)



Corresponding angles: 1 & 5 (upper left) 2 & 6 (upper right)
3 & 7 (lower left) 4 & 8 (lower right)

Alternate interior angles: between parallel lines and on opposite sides of the transversal 3 & 6 ; 4 & 5

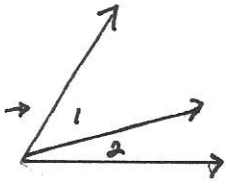
Alternate exterior angles: outside parallel lines and on opposite sides of transversal 1 & 8 ; 2 & 7

Same side interior angles: between parallel lines and on same side of transversal 3 & 5 ; 4 & 6

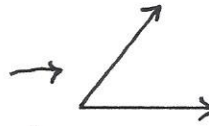
Given these definitions and theorems, if you know the measure of one angle, you can find all of the others. For example, if angle 1 = 120, then angle 5 will also = 120 (corresponding angles are equal) as will 4 and 8 (vertical angles are equal.) Angle 2 will equal 60 (1 and 2 form a straight angle) and 3, 6 and 7 will also equal 60 degrees (alternate interior angles and vertical angles).

Angle Definitions and Theorems;

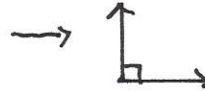
Adjacent Angles— 2 angles that have the same vertex, a common side, and no common interior points.



Acute angle – any angle between 0 and 90 degrees



Right angle—an angle equal to 90 degrees



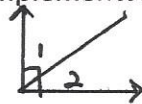
Obtuse angle—an angle between 90 and 180 degrees



Straight angle—an angle equal to 180 degrees

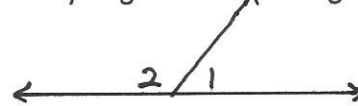
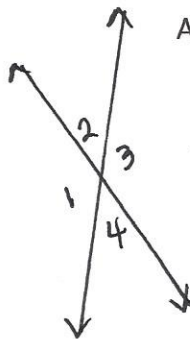


Complementary Angles—two angles that add to 90 degrees (Ex. 20 and 70)
two adjacent complementary angles form a right angle



$\angle 1 + \angle 2$ are complementary

Supplementary Angles—two angles that add to 180 degrees (Ex. 20 and 160); two supplementary angles form a straight angle.



Angle 1 + Angle 2 are supplementary

When 2 lines intersect, four angles are formed. The “back to back” angles are called vertical angles. In the diagram above 1 & 3 are vertical angles as are 2 & 4. **Vertical angles are always equal.**

The side by side angles are adjacent angles and, because they form a straight angle or because their exterior sides are opposite rays, are **supplementary**. In this diagram 1 & 2, 2 & 3, 3 & 4, and 1 & 4 are adjacent and supplementary.

If you know one angle, you can find the others. For example, if angle 1 = 110 degrees, then angle 3 would also be 110 because they are vertical angles and angles 2 and 4 would be 70 degrees because they are supplementary to 110.

If two lines are perpendicular, all four angles equal 90 degrees.

