Exploring Angle Pairs

Unit 1 Lesson 5

Exploring Angle Pairs

Students will be able to:

identify special angle pairs and use their relationships to find angle measures.

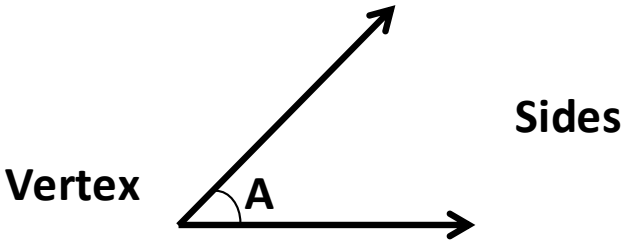
Key Vocabulary

- **Complementary and Supplementary angles**
- **Vertical angles**
- **Adjacent angles**
- **Corresponding angles**
- **Linear pair**
- **Alternate angles**

Measuring Angles

An **angle** is a measure of the turn between two lines that have a common end point. The rotation is measured in the anti-clockwise direction.

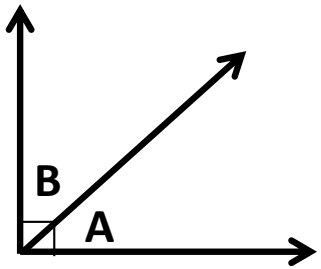
- The two lines form the sides of an angle.
- The point where two lines are meeting is called the **vertex.**
- The angle is represented by a $\angle$ symbol along with a letter.



Measuring Angles

Two angles are said to be **complementary angles** if their sum is 90 degrees.

The angles **A** and **B** shown in the figure are complementary since their angle sum is 90°.

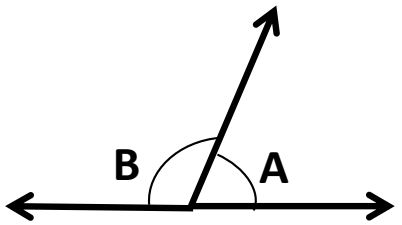


$$\angle A + \angle B = 90°$$

Measuring Angles

Two angles are said to be **supplementary angles** if their sum is 180 degrees.

The angles **A** and **B** shown in the figure are complementary since their angle sum is 180°.

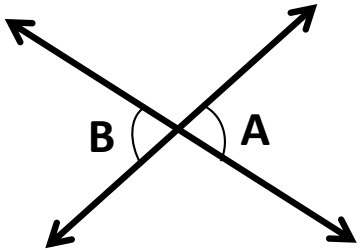


$$\angle A + \angle B = 180°$$

Measuring Angles

Vertical angles are the angles opposite to each to each when two lines are crossed. The two vertical angles are congruent.

The angles **A** and **B** shown in the figure are vertical angles and are congruent.

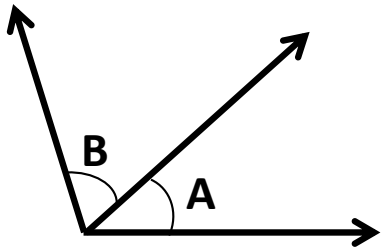


$\angle \mathbf{A} \cong \angle \mathbf{B}$

Measuring Angles

Adjacent angles are the angles having a common side and a common vertex.

The angles **A** and **B** shown in the figure are adjacent angles.

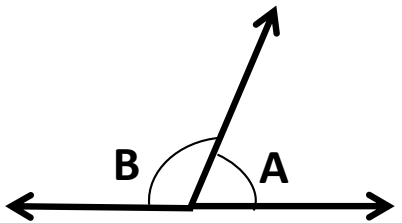


$\angle$ A is adjacent to $\angle$ B

Measuring Angles

A **linear pair** of angle is formed when two lines intersect each other. Two angles are **linear** if they are adjacent angles formed by two intersecting lines.

The angles **A** and **B** shown in the figure are adjacent angles and also a linear pair.

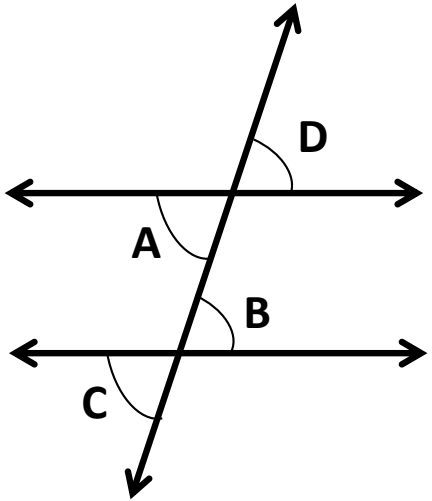


$\angle$ A and $\angle$B are linear

Measuring Angles

When two coplanar lines are crossed by a 3rd line (called the transversal), then the angles formed on the opposite sides of the transversal are called **alternate angles.**

- The pair of angles on the opposite side of the transversal but inside the two coplanar lines are **alternate interior angles (angles A** and **B** in the figure**).**
- The pair of angles on the opposite side of the transversal but outside the two coplanar lines are **alternate exterior angles (angles C** and **D** in the figure**).**
- If a transversal intersects two **parallel** lines, then the alternate angles are congruent.



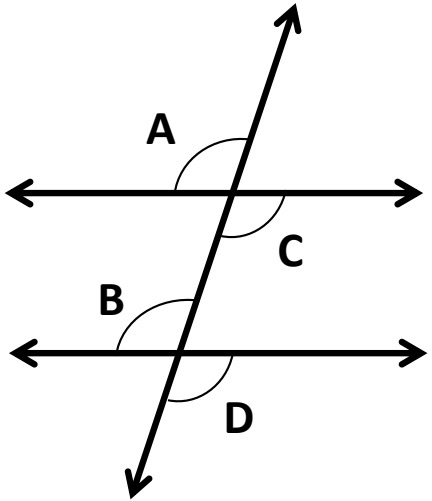
$\angle A \cong \angle B$ **and** $\angle C \cong \angle D$

Measuring Angles

When two coplanar lines are crossed by a 3rd line (called the transversal), then the angles formed on the same sides of the transversal are called **corresponding angles.**

- The angles **A** and **B,** and angles **C** and **D** are the pair of corresponding angles.
- If a transversal intersects two **parallel** lines, then the corresponding angles are congruent.

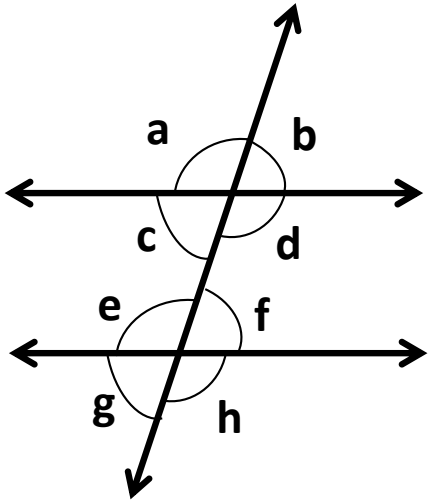
$\angle A \cong \angle B$ **and** $\angle C \cong \angle D$



Measuring Angles

Problem 1:

Identify all the pair of **alternate, vertical** and **corresponding** angles in the figure shown below.



Alternate angles:

angles a and **h, b** and **g, c** and **f, d** and **e**

Vertical angles:

angles a and **d, b** and **c, e** and **h, g** and **f**

Corresponding angles:

angles a and **e, c** and **g, b** and **f, d** and **h**