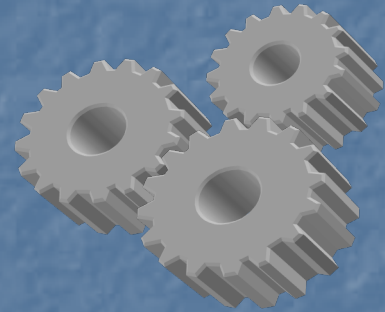# Angles

The basics

Introduction

- Angles will be used in virtually every chapter in Geometry this year. It is very important to know the basics of angles before moving into further chapters.
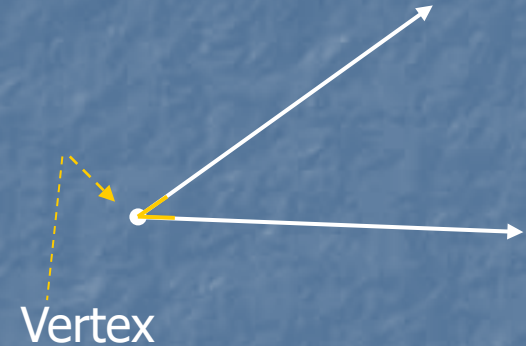
Topics of Discussion

- Angle parts
- Types of angles
- Relationships between angles
- Angle Addition Postulate

Angle Parts

- An angle is a figure formed by two rays with the same endpoint.

- The common endpoint is called the vertex of the angle.
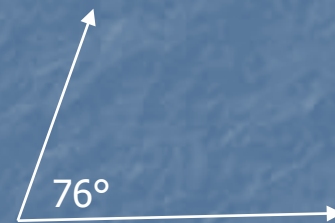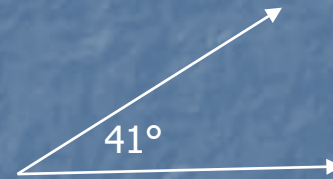
- Each of the rays is a side of the angle.

Vertex

Measure of an Angle

- An angle is measured in units called degrees.
- The more the two rays are separated from each other, the greater the angle will be.
  - to describe the measure of an angle we would say: m<1=22°
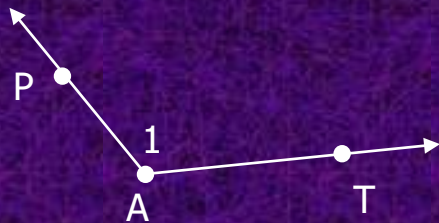
22°

41°

76°

120°

Naming the Angle

- An Angle can be named in one of three ways
  - A number assigned to it
  - It can be named after its vertex (if there is only one angle at that point)
  - Using three points on the angle (one from each side, and the middle vertex)
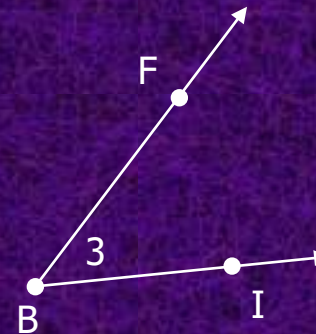
1

<1

B

<B

D

O

G

<DOG
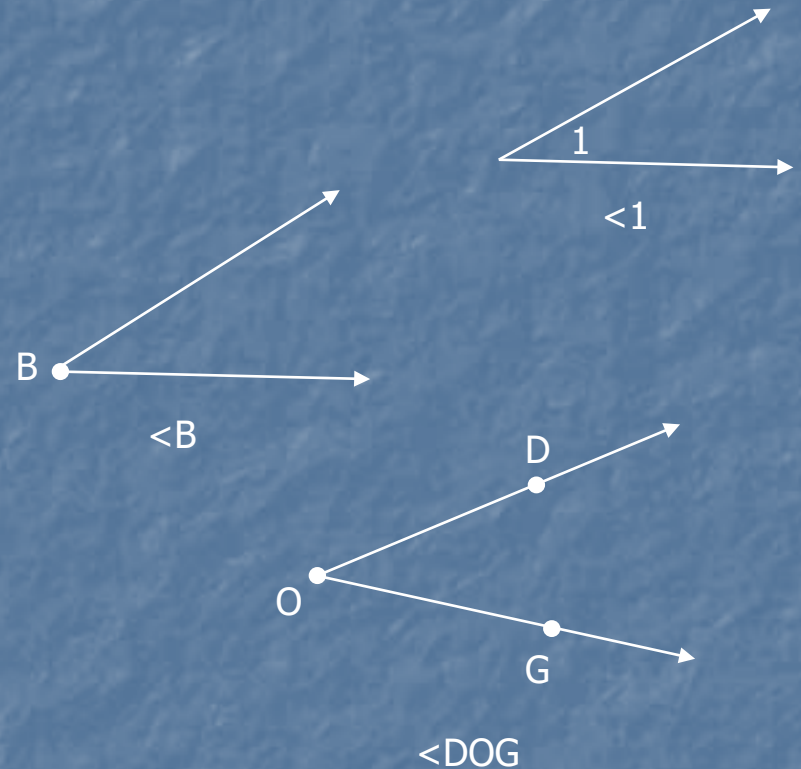
Give four names for each angle

1.)   **2.)**

<PAT   <A   <1   <TAP   <FBI   <3   <B   <IBF
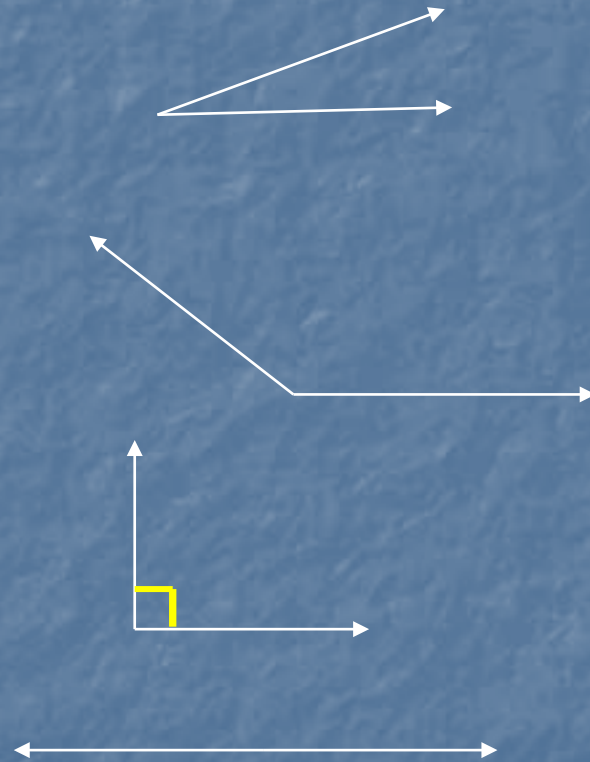
**note: the numbers here are used to name the angle. If it were meant to show the measure, it would have a degree symbol.

Types of Angles

- Angles are classified by their measure

  - Acute angles are less than 90°

  - Obtuse angles are greater than 90°

  - Right angles are exactly 90°

  - Straight angles are 180°

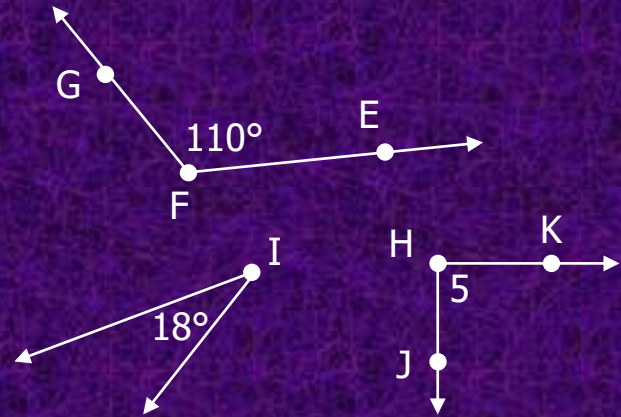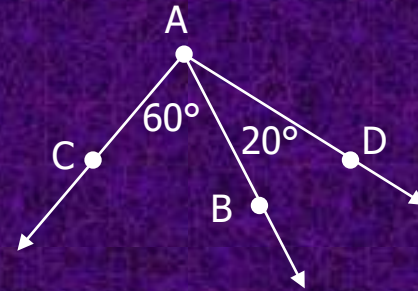# Types of Angles

Acute angle

Right angle

Obtuse angle

Fill in the blanks using the figures.

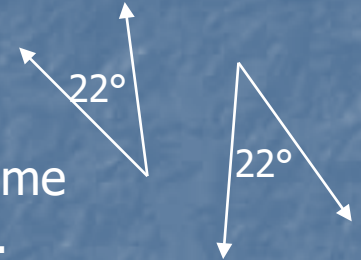- m<BAC = ___60°___

- Two names for the obtuse angle are ___<F___ and ___<GFE___.

- ___m<I___ = 18°

- Two other names for <H are ___<5___ and ___<JHK___

- m< DAC = ___80°___
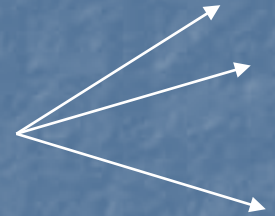
Angle Relationships

- **Congruent Angles**   Angles that have the same measure are congruent.
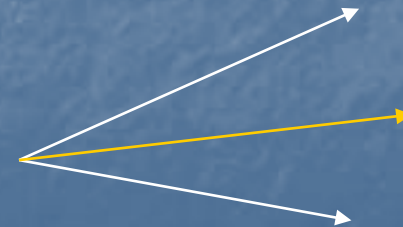
22°

22°

- **Adjacent Angles**   Coplanar angles that have the same vertex and one common side are adjacent.
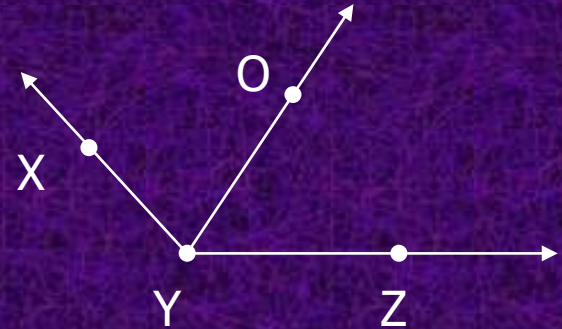
- **Bisector of an Angle**   A ray that cuts an angle into two equally sized angles is a bisector.
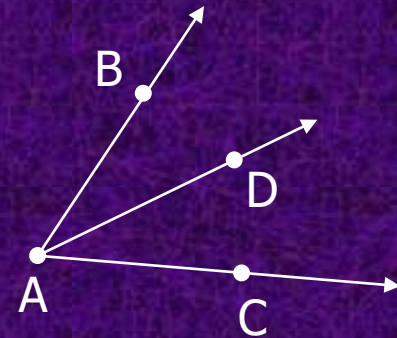
**This forms two congruent and adjacent angles

Solve:

1.) If m<XYZ=122°, and YO⃗ is a bisector of <XYZ, then m<OYZ=___61°___.

2.) If AD⃗ is a bisector of <BAC, and m<BAD=32°, then m<DAC=___32°___, and m<BAC=___64°___.

Angle Addition Postulate

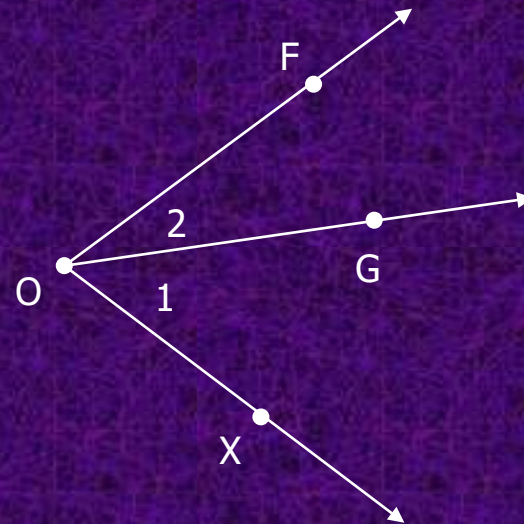- The Angle Addition Postulate states that if we have two adjacent angles, then the sum of the two small angles formed will be equal to the larger angle.

- The pieces add up to the whole.

C

1

A

2

T
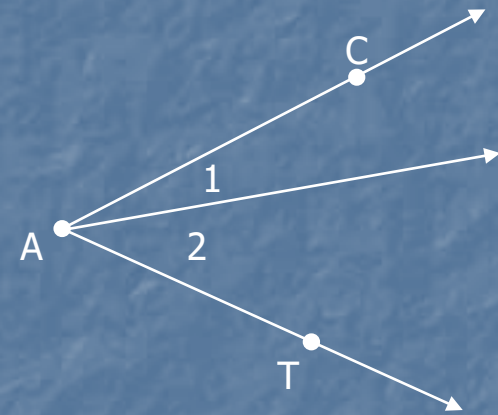
m<1 + m<2 = m<CAT

Find the value of x

- If m<1=28°, and m<2=37°, then m<FOX=_____65°_____.
- If m<2=37°, and m<FOX=77°, then m<1=_____40°_____.
- If m<GOX=45°, and m<XOF=80°, then m<2=_____35°_____.

F

2

O

1

G

X

Summary

- Angles are formed by intersecting rays.

- Angles are named in three ways.

- There are three main types of angles we will use.

- Special angle relationships exist that show connection between angles.