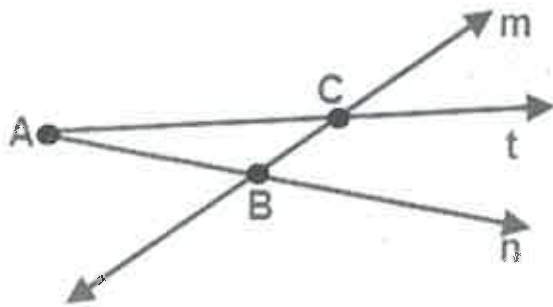


### Angles

- Angles are formed by the intersection of two lines, segments, or rays.



1. Name an angle that can be identified using only 1 point.

$\angle A$

2. Name an angle that must be identified using 3 points.

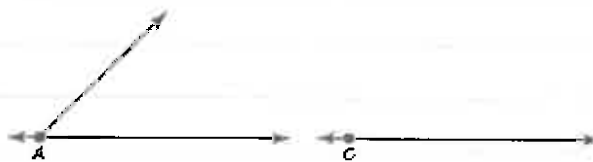
$\angle ABC$  or  $\angle ACB$

use 3 or more points because there is more than one angle at vertex B. and vertex C.

### Construct a Copy of an Angle

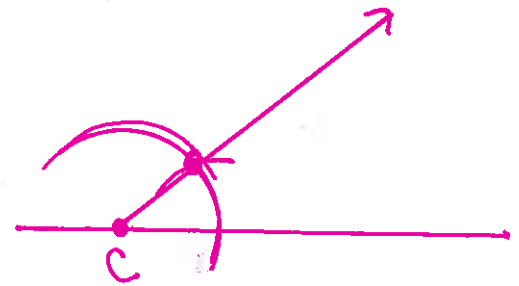
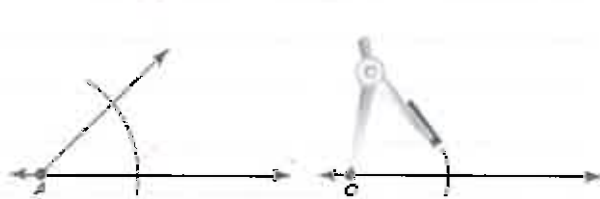
#### Construct a Starter Line

Use a straightedge to construct a starter line. Label point C on the new segment.



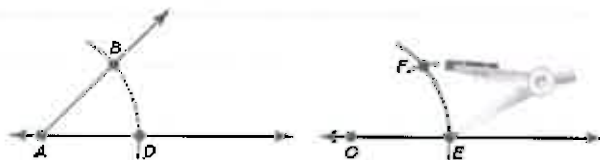
#### Construct an Arc

Construct an arc with center A. Using the same radius, construct an arc with center C.



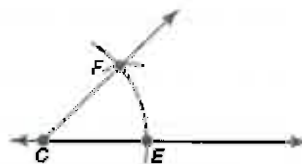
#### Construct Another Arc

Label points B, D, and E. Construct an arc with radius BD and center E. Label the intersection F.

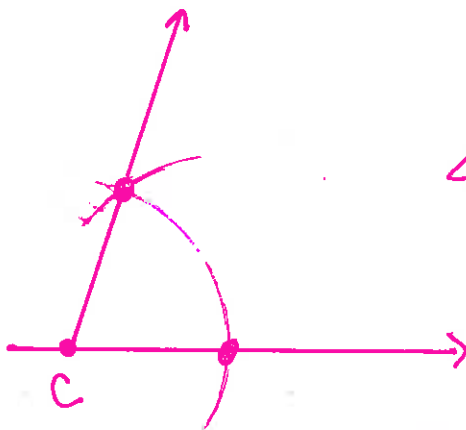
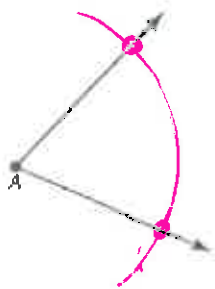


#### Construct a Ray

Construct ray CF.  
 $\angle BAD \cong \angle FCE$

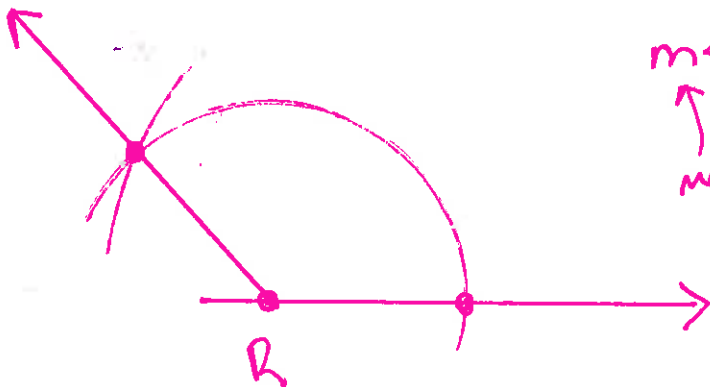
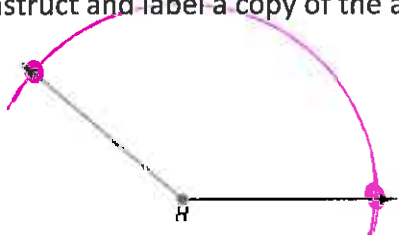


Construct and label a copy of the angle. Write a congruency statement about the angles.



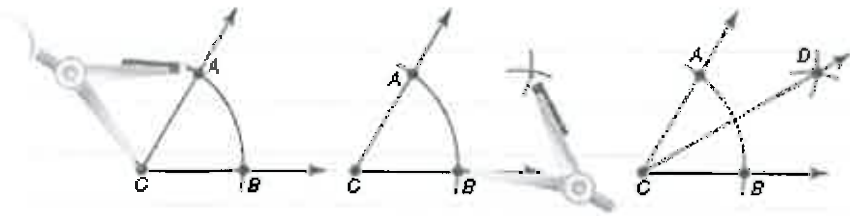
$\angle A \cong \angle C$   
↑  
Congruency  
compares  
objects

Construct and label a copy of the angle. Write an equality statement about the angles.

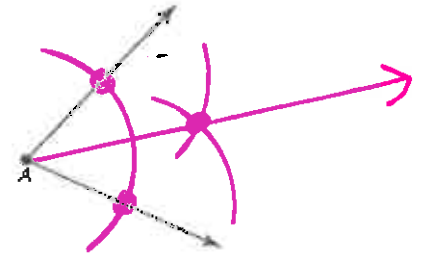


Equals  
compares  
measure.  
↓  
 $m\angle H = m\angle R$   
↑  
Means  
"measure"

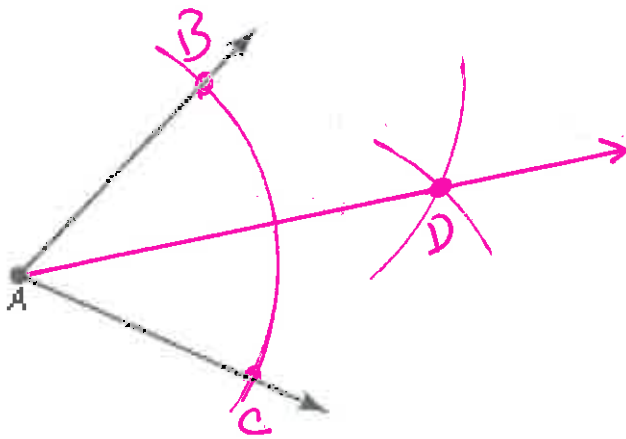
## Construct the Bisector of an Angle



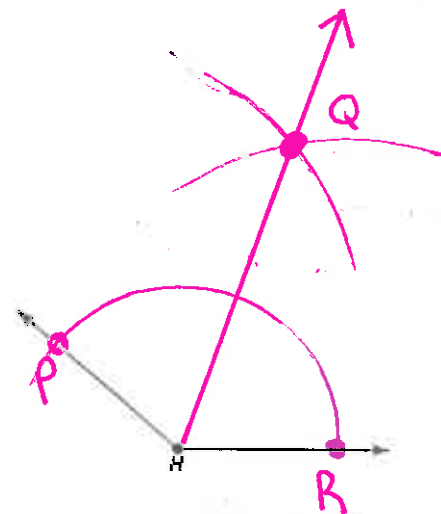
<p><b>Construct an Arc</b></p> <p>Place the compass at <math>C</math>. Construct an arc that intersects both sides of the angle. Label the intersections <math>A</math> and <math>B</math>.</p>	<p><b>Construct Another Arc</b></p> <p>Place the compass at <math>A</math>. Construct an arc. Then, place the compass point at <math>B</math>. Using the same radius, construct another arc.</p>	<p><b>Construct a Ray</b></p> <p>Label the intersection of the two arcs <math>D</math>. Use a straightedge to construct a ray through <math>C</math> and <math>D</math>. Ray <math>CD</math> bisects <math>\angle C</math>.</p>
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Construct and label the bisector the following angles. Write a congruency or equality statement about the angles formed.



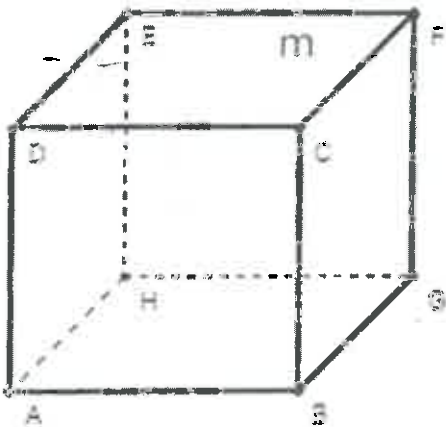
$$\angle BAD \cong \angle CAD$$



$$m\angle PHQ = m\angle RHQ$$

## Planes

- A plane is a "flat surface" that extends in two directions forever.
- A plane can be identified using 3 or more **non-collinear** points that are on the plane or with a single lower case letter.



**For example:** The "Front" of this box can be identified as Plane ADB or Plane BADC.

1. Name the "top" plane, 3 different ways.

Plane DEF  
plane DEFC  
plane m.

2. Name the intersection of planes DEC and EFG.

planes DEC and EFG intersect to form line EF.

"Top" ↓  
"Back" ↓

3. Name all planes that contain point A.

Front: plane ADC  
Left: plane ADE  
Bottom: plane AHG

4. Name all planes that contain both points A and H.

Left: plane ADE  
Bottom: plane AHG

5. Name all planes that contain points A, H and B.

Bottom: plane AHB.

6. Name all planes that contain points A, H, B, and C.

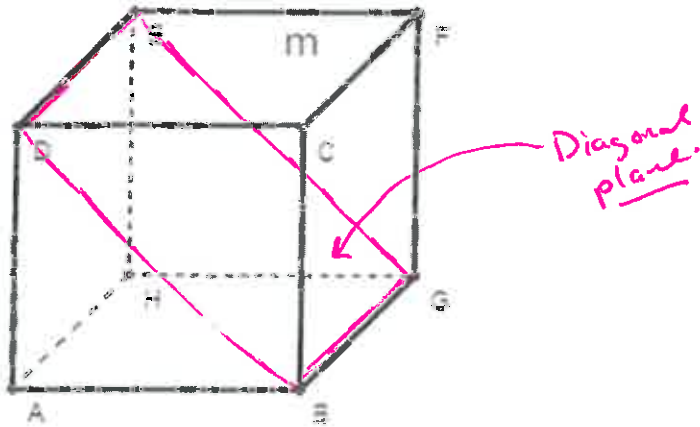
There are no planes that contain all 4 points.

7. What is the **minimum** number of **non-collinear** points required to form a single, unique plane? Explain.

3 because, 2 points would only determine a line, not a plane.

**Coplanar** – Lines or points that lie on the same plane.

**Skew Lines** – Lines that are not coplanar.



8. Determine if the objects are **coplanar** or **skew**. Explain how you know.

a.  $\overline{DE}$  and  $\overline{CF}$

Coplanar because they are both in plane DEF (Top)

b.  $\overline{DE}$  and  $\overline{FG}$

Skew Because they are in different planes.  
 $\overline{DE}$  is part of the top/left and  $\overline{FG}$  is part of the back/right

c.  $\overline{DE}$  and  $\overline{EH}$

Coplanar, because they are both part of plane DEH which is the left side of the box.

d.  $\overline{DE}$  and  $\overline{BG}$

Coplanar, although  $\overline{DE}$  is part of top/left and  $\overline{BG}$  is part of bottom/right, a diagonal plane can be created that contains both segments.

9. Explain the difference between two lines being **parallel** and two lines being **skew**.

parallel and skew both mean lines that don't intersect, but parallel lines are coplanar and skew lines are not coplanar.

