4. a - Constructions

1) HW Summary 4.b
2) Check off short 4.7 assignment
3) Introduction to Ruler and Compass
4) 4 Constructions (A - D)
5) In Class Assignment

Pg. 270 #2, 3, 8, 9, 16-19, 27-29

4. Ruler and Compass

Understand which purpose each tool serves

**Ruler**
- is often just called a **Straightedge**
- allows you to draw straight line (segments)
- two (end)points are required to draw a segment
- does not "measure" distance so you cannot "copy" a distance with just a ruler

**Compass**
- can reproduce distance
- draws all points the same distance from the needle
- usually do not need to draw entire circle
- when using a specific distance on a compass, "lock" the compass to make sure the distance doesn't change

**Construction A: Segment Congruent to a Given Segment**

Need: Original segment (segment AB)
Line on which to draw new segment (line CD)

1) Choose any point on line CD and call it P (P is sometimes given)
2) Set compass to "measure" of segment AB
3) Place needle point at P
4) SKETCH arc with set compass that intersects line CD
5) Label where the arc and line CD intersect as point Q
6) The segment PQ created is congruent to segment AB
4. Ruler and Compass

Construction B: Creation of Midpoint (Bisector of a segment)
Need: Original segment to bisect (segment AB)

1) Set compass to size greater than half the segment length
2) SKETCH an arc on each side of the segment with needle point at
3) Repeat step 2 using needle point B
4) Arcs sketched should intersect on both sides of segment AB.
5) Connect arc intersection points with ruler
6) Point where line from 5 and segment AB intersect label M
7) M is the midpoint of segment AB (line created is segment bisector

Construction C: Angle Congruent to a Given Angle
Need: Original angle (vertex of A)
Ray to be side of new angle (ray EF)

1) Set compass to a large size and SKETCH arc with needle point A
   that intersects the sides of the given angle at points labeled
   B and C
2) Use same compass setting and needle point E to intersect ray at
   point labeled F
3) Set compass to measure of segment BC (not shown)
4) Use set compass and needle point F to SKETCH and arc that
   intersects arc formed in step 2. Call this intersection point D
5) Draw ray ED using straight edge
6) Angle FED (constructed) is congruent to Angle BAC (given)

4. Ruler and Compass

Construction D: Bisector of a Given Angle
Need: Original angle (vertex of P)

1) Set compass to a large size and SKETCH arc with needle point P
   that intersects the sides of the given angle at points
   labeled Q and R
2) Set compass to measure of segment RQ (not shown)
3) Use set compass and needle point Q to SKETCH arc on the
   interior of the angle
4) Repeat step 3 with needle point at R
5) Label point of arc intersection as W
6) Use ruler to DRAW ray PW
7) ray PW bisects angle QPR

Assignment (Due at End of Class)

1) Carefully and Neatly Complete Constructions WS