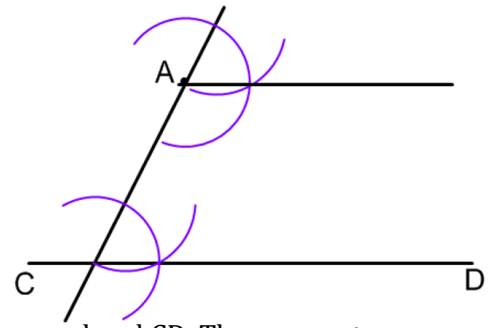**Chapter 3: Constructions**
Topic 8: Parallel Lines Construction
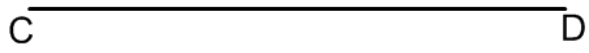
Construction:

Construction # 12: Parallel Lines

Given: Line CD
**Task:** Construct a line segment parallel to segment CD, called AB

Detailed Steps:
1.) Create any point that is off the line CD. Label that point A.
2.) Draw any transversal line that goes through point A and line CD.
3.) Using a compass, draw an arc from the point of intersection of the transversal and CD. The arc must cross both segments. (the pointy part of your compass on C)
4.) Do not change the length of your compass and draw another arc from point A. (the pointy part of your compass on A). Be generous with the arc length.
5.) Take the compass and put it on the point of intersection of the transversal and the first arc. Measure where it intersects line CD. (This is the copying of an angle)
6.) With the compass the same distance in step 5, put the compass on the second arc where it hits the top of the transversal and draw in an arc.
7.) Draw a line connecting the point of intersection of the two arcs (from step 6) and point A. This is our parallel line. Check that it visually looks parallel!
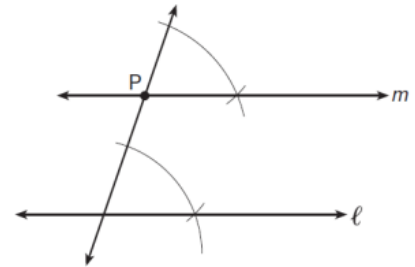
You try:

C   D

Construct a line segment parallel to segment JA that passes through the point L.

.L

J   A
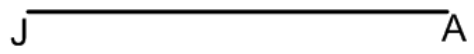
Chapter 3: Constructions
Topic 8 Homework: Parallel Lines Construction

Complete all of the questions below.

1.) The diagram below shows the construction of line m parallel to line l, through point P.

Which theorem was used to justify this construction?

    (1) If two lines are cut by a transversal and the alternate interior angles are congruent, the lines are parallel.

    (2) If two lines are cut by a transversal and the interior angles on the same side are supplementary, the lines are parallel.

    (3) If two lines are perpendicular to the same line, they are parallel.

    (4) If two lines are cut by a transversal and the corresponding angles are congruent, they are parallel.

2.) Given the correctly drawn construction below, which statement is **not** true?
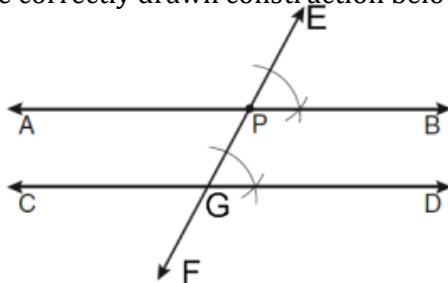
    (1) $\angle EPB \cong \angle PGD$

    (2) $\angle APG + \angle CGP = 180$

    (3) $\angle FGD \cong \angle EPB$

    (4) $\angle FGC \cong \angle EPB$

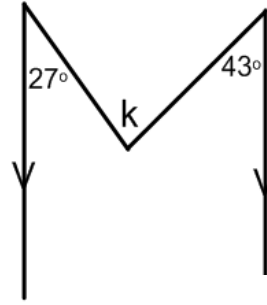3.) Construct a segment parallel to line segment LP that passes through the point A.
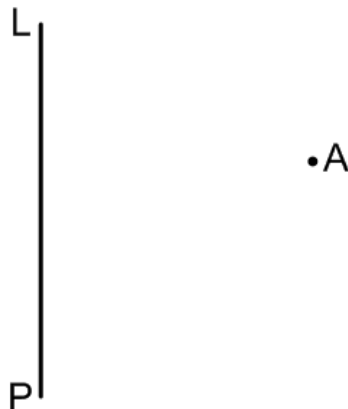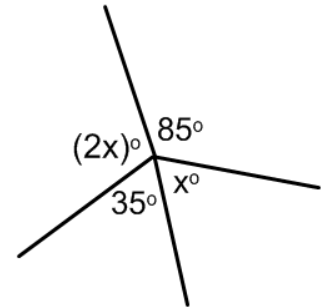
Review Questions:

4.) Use the diagram below to find the measure of <k. Justify your solution. (You should use auxiliary lines).

$27°$ $43°$ k

5.) Use the diagram below and your knowledge of Geometry to find the value of x. Give reasons for your calculations. Diagram is not drawn to scale.

$(2x)°$ $85°$ $35°$ $x°$

6.) Find the equation of the line parallel to 3x + 6y = 9, that passes through the point (-5, 6).

7.) Lines p and q are intersected by line r, as shown in the diagram below. If m<1 = 7x – 36 and m<2 = 5x + 12, find the value of x that would make p||q. Justify your solution.

p   q

r   2   1