Geometry Week 15 Assignment:

Day 1: pp. 283-286 #1-12, 21-25
Day 2: p. 285 #14-17
Day 3: pp. 289-290 #1-18
Day 4: pp. 293-294 #1-10
Day 5: p. 294 #11-15

Notes on Assignment:

***General Note**: **When doing proofs, there is often more than one way to prove something. So, your proof may not match the one in the book and that is ok. Also, if you do not know where to start on a proof, start with your "Need" and "Know" lists.**

Pages 283-286:

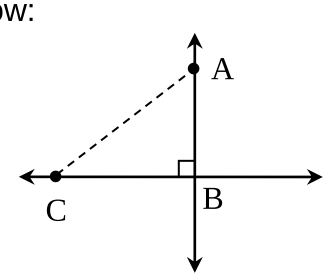
Work to show:

#1-12: Answers only is ok.
#14-17: Proofs
CR: Answers only is ok.

#8-12: These are all based on the Hinge Theorem.

#8: Notice that the 2 triangles have sides of 4 and 7. The 3rd sides will be compared based on the angles that the 4 and 7 sides make.

#14: Draw a line and label point C on the line. Draw a point, A, above the line and then draw a perpendicular line from A through the line at point B. This is an auxiliary line. You need to show that AC is larger than AB (which is the perpendicular from A to the line). See the drawing below:



To prove that this, you are going to need to use the theorem that was proved in #13. You can use this without proof.

#15: Work backwards from what you are trying to prove. If $m\angle C > m\angle A$, then what must be true about their opposite sides? Can you prove that about their opposite sides?

#16: This proof involves the Hinge Theorem. You have 2 triangles, ΔAMC and ΔMBC. Two sides in ΔAMC are congruent to 2 sides of ΔMBC. ($AM \cong \overline{MB}$ and $MC \cong \overline{BC}$. (You can show this based on what is given.)) If you can show that m$\angle$AMC > m$\angle$MBC, then you can use the Hinge Theorem to show that AC > CM.

#17: Look at how $\angle$CMB and $\angle$B are related and then look at how $\angle$CMB and $\angle$A are related.

<u>Pages 289-290</u>:

Work to show:

#1-5: Answers only is ok.
#6-12: Sketch and possible explanation
#13-18: Answers only and possible explanations

#6-12: Identify the triangle based on the side lengths (scalene, isosceles, equilateral). If there is no triangle, is it because the points are collinear or that the triangle is impossible?

<u>Pages 293-294</u>: #1-15

Work to show:

#1-10: Answers only
#11-15: Proofs

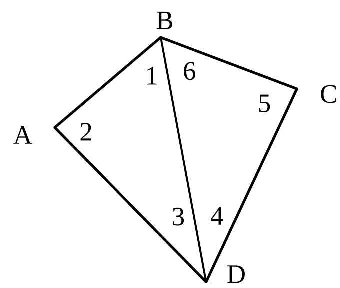
#6-10: Draw a counterexample that will disprove each of these.

#11: Draw the parallelogram ABCD with diagonals intersecting at point E. You need to prove that BE = ED and AE = EC. That would make E the midpoint of both diagonals, which fulfills the definition of bisector. In order to show this, you will need to show that BEC and DEA are congruent.

#12: To show that ABCD is a parallelogram, you will need to show that the opposite sides are parallel. Your best bet for that is the Parallel Postulate, and the best way to get your angles for the Parallel Postulate is from congruent triangles. Use what is given to show both pairs of triangles congruent. Then use CPCTC to get the angles congruent for the Parallel Postulate to be used.

#13: Draw rectangle ABCD with diagonals. If you can show that Δ ABC $\cong$ ΔDCB, then segments AC and BD must be congruent. You can use the fact that a rectangle is a parallelogram, and also the fact that a rectangle has right angles in it (by definition).

#14: Draw a quadrilateral and draw one diagonal. You know that the measures of the angle of the 2 triangles each add up to 180° (Theorem 6.16). Write those 2 equations and then add them together. Then show that the 2 smaller angles (1&6 and 3&4) add up to the larger angles B and D. Finish with some substitution. Look at the diagram below:



#15: Draw parallelgram ABCD with diagonals. If you can show that the 2 triangles formed by one diagonal are congruent, and the 2 triangles formed by the other diagonal are congruent, then you can use CPCTC to show the opposite angles of the parallelogram are congruent.