Math 331 Worksheet 6

Note: None of these problems are for a grade, though you may obtain extra credit for writing up proofs on the board.

1) Prove the following proposition from the book. You may use any and all betweenness, congruence, and incidence axioms, plus their consequences deduced in the book.

　　Proposition 3.15) a) Vertical angles are congruent to each other. b) An angle congruent to a right angle is a right angle. See p.19 for the appropriate definitions. *Hint:* Proposition 3.14.

2) Now look at Proposition 3.23, also labeled Euclid's Fourth Postulate. Is this the same as 3.15b) above? Once you have figured it out, look over the proof of 3.23 with your group and make sure everyone understands it.

3) Prove the following propositions from the book. You may use any and all betweenness, congruence, and incidence axioms, plus their consequences deduced in the book.

　　a) (Proposition 3.8) If D is in the interior of $\sphericalangle CAB$, then i) so is every other point on ray $\overrightarrow{AD}$ except A; ii) no point on the opposite ray to $\overrightarrow{AD}$ is in the interior of $\sphericalangle CAB$. *Hint*: use Pasch's Theorem on both parts.

　　b) (Proposition 3.17- ASA) Given $\triangle ABC$ and $\triangle DEF$ with $\sphericalangle A \cong \sphericalangle D$, $\sphericalangle C \cong \sphericalangle F$, and $AC \cong DF$. Then $\triangle ABC \cong \triangle DEF$. *Hint:* there is an outline on page 151.