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Homework H10
MATH 3110/5110
Due Fri April 8, 2022

Problem:	1	2	3	4	5	Total	Rescaled
Your Score:							
Possible:	20	20	20	60	20	100	10

This homework actually has 140 points possible. Any points scored over 100 will be Extra Credit.

Suggested Exercises: 6.2 # 1, 2, 3, 5, 6, 7, 8, 12, 15
6.3 # 1, 2, 3, 4, 5, 10

[1] Theorem 6.2.1 says that a neutral geometry satisfies the Angle-Side-Angle (ASA) Axiom. In Video 6.2, I provide a detailed proof, with numbered statements and more drawings.

Copy the statements and drawings, providing justifications where indicated.

[2] (6.2#1) **Prove** Theorem 6.2.2, the $CA \rightarrow CS$ Theorem. See Video 6.2 for hint.

[3] Three basic proofs:

(a)(6.2#6) **Prove:** In a neutral geometry, if triangle ΔABC and points D, E satisfy $A - D - E - C$ and $\overline{AD} \simeq \overline{CE}$ and $\angle BAC \simeq \angle BCA$, then $\angle ABE \simeq \angle CBD$.

(b)(6.2#7) **Prove:** In a neutral geometry, if quadrilateral $\square ABCD$ has $\overline{AB} \simeq \overline{CD}$ and $\overline{AD} \simeq \overline{BC}$, then $\angle ABC \simeq \angle CDA$ and $\angle BCD \simeq \angle DAB$.

(c)(6.2#8) **Prove:** In a neutral geometry, if ΔABC and points D, E satisfy $A - D - B$ and $A - E - C$ and $\angle ABE \simeq \angle ACD$ and $\angle BDC \simeq \angle BEC$ and $\overline{BE} \simeq \overline{CD}$, then $\overline{AB} \simeq \overline{AC}$.

[4](6.3#4) Prove the following: In a neutral geometry,

If ΔABC is isosceles, with $\overline{AB} \simeq \overline{AC}$, then the base angles $\angle ABC$ and $\angle ACB$ are acute.

[5] Theorem 6.3.8 (The Triangle Inequality of Neutral Geometry) says

In Neutral Geometry triangle ΔABC , then inequality $AC < AB + BC$ is true.

The book provides a proof, but in paragraph form and without any illustrations. In Video 6.3b, I provide a proof with 10 numbered statements, a proof that is basically the same idea as the book's proof.

Justify and Illustrate the statements of my proof from Video 6.3b.