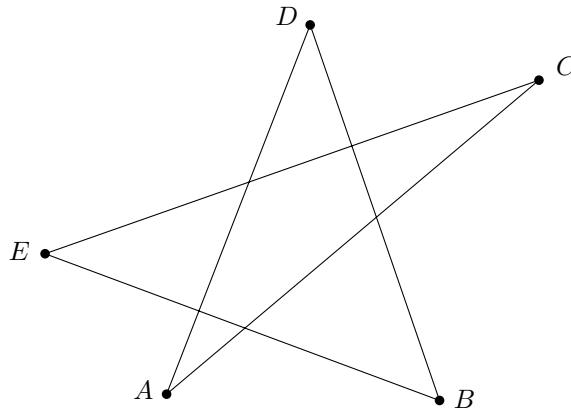


Math 340: Geometry

Homework 1

1. Exercises 2.1.2, 2.1.3, 2.1.4 and 2.1.5.
2. Exercises 2.2.1, 2.2.2 and 2.2.3.
3. Exercise 2.3.3.
4. Exercises 2.5.2 and 2.5.3.
5. Exercises 2.5.4 and 2.5.5.
6. Let ABC be a right triangle with $\angle A = 90^\circ$. Let Y and Z be the midpoints of segments AC and AB , respectively. Let $BY = \sqrt{73}$ and $CZ = 2\sqrt{13}$. Find the length of BC .
7. Let $ABCDE$ be a (not necessarily regular) five point star. Find the sum (with proof)

$$\angle A + \angle B + \angle C + \angle D + \angle E.$$



8. Prove or disprove: For triangles ABC and $A'B'C'$ we know that $AB = A'B'$, $AC = A'C'$ and $\angle BCA = \angle B'C'A'$. Then they must be congruent.

BONUS What is the least possible area of a triangle $\triangle ABC$ with altitudes satisfying $h_a \geq 3$, $h_b \geq 4$, $h_c \geq 5$?
Note: h_a is the height of the triangle when BC is the base, h_b is the height when AC is the base, and h_c is the height when AB is the base.