MAT 515: Geometry for Teachers
Problem Set 6

Stony Brook University Fall 2019
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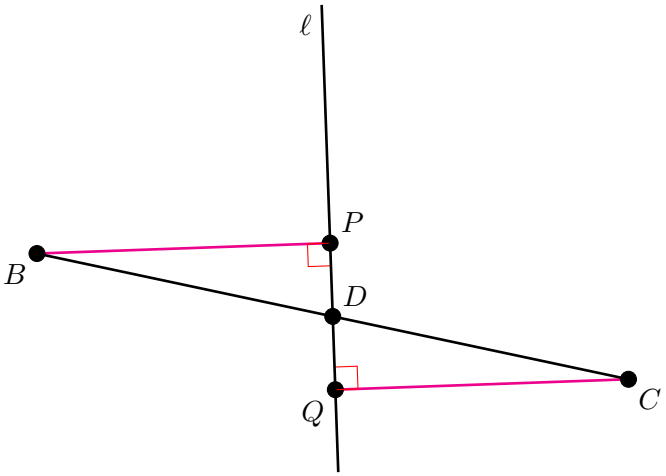
Problem 1. (5 points) Consider a line ℓ and let B and C be two points not on ℓ. Suppose that the segment BC intersects ℓ at D. Let BP and CQ be two perpendicular dropped from B and C onto the line ℓ. Show that if $BP = CQ$, then $BD = CD$.



Problem 2. (2+2+2 points)
Using a compass and a straightedge, construct a right triangle given:

(a) both of its legs;

(b) one of the legs and the hypotenuse;

(c) one of the legs and the adjacent acute angle.

Problem 3. (*Bonus problem*, 5 points)
Consider a convex quadrilateral $ABCD$ and let E be a point in the interior of $ABCD$. Show that

$$EA + EB < AD + DC + CB.$$

Hint: compare with Problem 5 (c) from Midterm 1.

Due Date: Wednesday October 16.