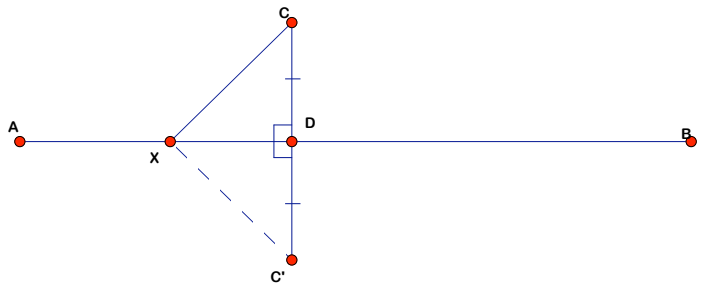


Problem 19.  $AB$  is a line,  $C$  is a point not on this line,  $CD$  perpendicular to the line  $AB$ . Let  $X$  is a point on the line  $AB$  different from the  $D$ . Prove that  $|CX| > |CD|$ . The distance  $|CD|$  is called distance between the point  $C$  and the line  $AB$ . Hint: Make an additional construction like in the picture. Use triangle inequality.



Problem 20. Let lines  $n$  and  $m$  are parallel. Prove that if points  $A$  and  $B$  are on the line  $n$ , then the distance from the point  $A$  to the line  $m$  is equal to the distance from the point  $B$  to the line  $m$ . In other words points on the line  $n$  are equidistant.

Problem 21. Prove that points on angle bisector are equidistant from the sides.

Problem 22. Prove that if a point is equidistant from the angle sides, then it is on the angle bisector.

Problem 23. In triangles  $\triangle ABC$  and  $\triangle DEF$  the altitude  $AG$  has the same length as the altitude  $DH$ , and the median  $AI$  has the same length as the median  $DJ$ . We also given that  $|BC| = |EF|$ . Prove that  $\triangle ABC \cong \triangle DEF$ . Hint: First prove that  $|GI| = |HJ|$ .

Problem 24. In the quadrilateral  $ABCD$   $|AB| = |AD|$  and  $|CB| = |CD|$ . Prove that  $AC \perp BD$ .

Problem 25. Assume lines  $a$  and  $b$  are parallel and a line  $c$  intersects  $a$ . Prove that  $c$  intersects  $b$ .