

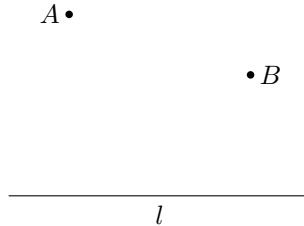
MATH 6: HANDOUT 13
GEOMETRY: RULER AND COMPASS, ORIGAMI

HOMEWORK

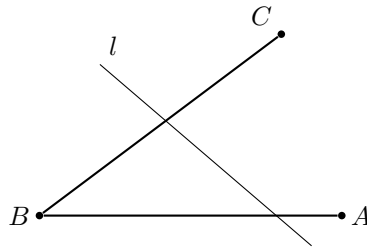
In the homework, the words “construct” or “find” mean “construct using ruler and compass.”

How can you find the point on the railroad (line l in the figure below) which would be at equal distance from two villages (points A, B in the figure below)? [Hint: if this point is at equal distance from A, B , then one can draw a circle with center at this point which would go through A, B ..]

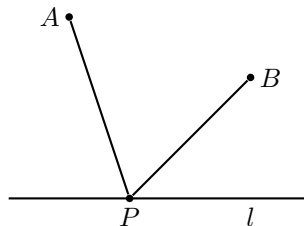
1. How can you find the point on the railroad (line l in the figure below) which would be at equal distance from two villages (points A, B in the figure below)? [Hint: if this point is at equal distance from A, B , then one can draw a circle with center at this point which would go through A, B ..]



2. Given an angle $\angle ABC$ and a line l intersecting both sides of this angle, find a point P on l which would be at equal distance from the two sides of the angle (i.e., the two perpendiculars dropped from P to the sides of the angle would have the same length).

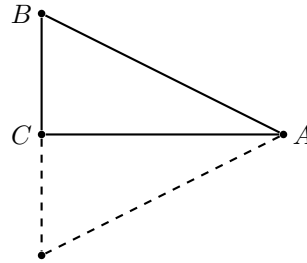


3. Given a triangle $\triangle ABC$, construct inside it a point which would be at equal distance from all three vertices of the triangle.
4. The figure below shows two villages A and B . A horseman starts at village A , goes to the river (line l in the figure) to let the horse drink, then goes to village B . How should he choose the point P on the river to make his trip as short as possible?

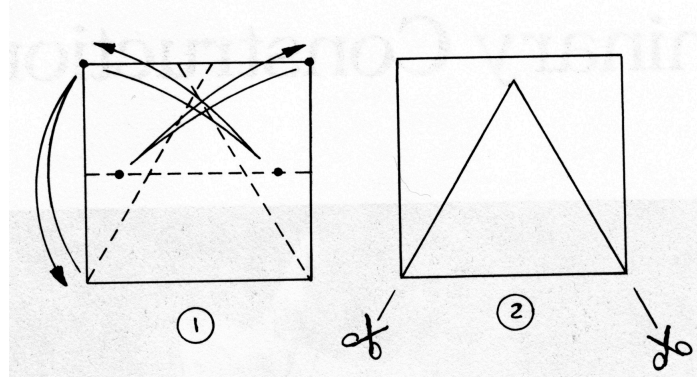


5. Given a square sheet of paper, find its center by folding.
6. Given a paper triangle, find the center of inscribed circle by folding.

7. (a) Let ABC be a right triangle in which one of the legs is exactly $1/2$ of the hypotenuse: $BC = \frac{1}{2}AB$. What are the angles of such a triangle? (*Hint*: if you put two such triangles together, as indicated by the dotted line, what triangle do we get?)

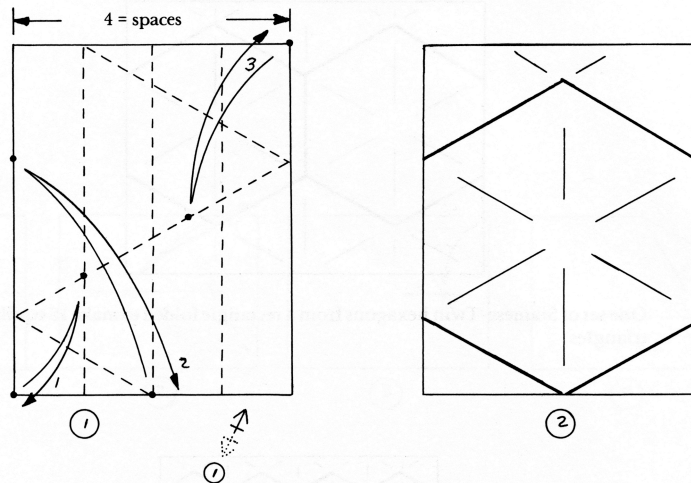


- (b) The attached figure shows how you can construct an equilateral triangle from a square by folding. Can you explain why it does indeed give an equilateral triangle? Construct one and check.



* (c) How you can construct an equilateral triangle from a rectangle (by folding)?

8. The attached figure shows how one can make a regular hexagon from a rectangular piece of paper. Can you explain why this does give a regular hexagon? Make one and check that it is indeed regular.



(funny double arrow below the first figure means “turn over and repeat step 1”).

9. The figure below shows a rectangle divided into several pieces. Which of the two rectangles, A or B, has larger area?

