Constructing a Perpendicular Bisector on the Coordinate Plane

Ayesha is traveling through Europe. She is currently in Istanbul, Turkey and her friends in Oslo, Norway, wish to meet up. Ideally, it would be somewhere that is equidistant for both.

Find the coordinates for Istanbul and Oslo. I(____,____)   O(____,____)

Connect I and O to form $\overline{IO}$. Find the location of the midpoint. Near what European city is it located? Label it point K. K(____,____)

*Ayesha and her friends don't find this city particularly interesting and want to expand their options. They know from geometry that the **perpendicular bisector** is defined as the locus* of all points equidistant from two endpoints of a segment. ("locus" means is a set of points.)*

What is a perpendicular bisector in more simple terms? Think back to our first compass/straightedge construction.

So any point on the perpendicular bisector of $\overline{IO}$ should be the same distance from I and to O.
Let's make this line.

Task 1:

Write the equation of the line that contains points I and O.   Final Answer: _____
- Find the slope
- Plug slope and either I or O's coordinates into point-slope formula
- Simplify and solve for y

Task 2:

Write the equation of the perpendicular bisector of $\overline{IO}$.   Final Answer: _____

- The slope of $\overline{IO}$ was found in the last task, so the perpendicular slope will be: _____
- What point on $\overline{IO}$ will the bisector pass through? _____
- Write the equation for the line using the point and slope you just found, using the same procedure as Task 1.

Task 3:

Solve the equation you found in Task 2 for y, putting it in slope-intercept form. What is the y-intercept? _____

Graph this line onto the map. Then choose a city along it for Ayesha and her friends to meet up.