### 2.1 Perpendicularity

## Section Objectives:

1. Recognize the need for clarity and concision in proofs
2. Understand the concept of perpendicularity

Definition of Perpendicular: If lines, rays, or segments intersect and form right angles, then they are perpendicular.


Example of a proof using the definition of perpendicular:
Given: $\boldsymbol{a} \perp \boldsymbol{b}$
Prove: $\Varangle 1 \cong \Varangle 2$


Note: Perpendicularity, right angles, and $90^{\circ}$ all go together - this is evidence that can be used to prove one-another. Be careful when building your case since you shouldn't simply exchange one for the other. (notice the red arrows above)

Assumptions: As is the case with right angles, you may $\underline{N O T}$ assume perpendicularity from a diagram!

Application: The x -axis and y -axis are perpendicular number lines that intersect at one point called the origin. The coordinates at the origin as an ordered pair are $(0,0)$. This means the distances on the x and y number lines needed to reach that point on a coordinate plane are both zero units!

