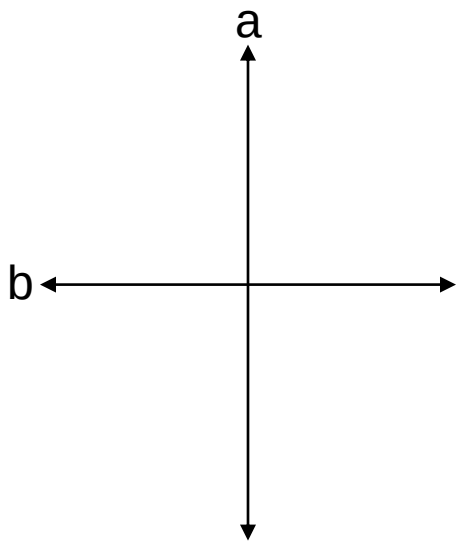
2.1 Perpendicularity

Symbol for perpendicular: ⊥

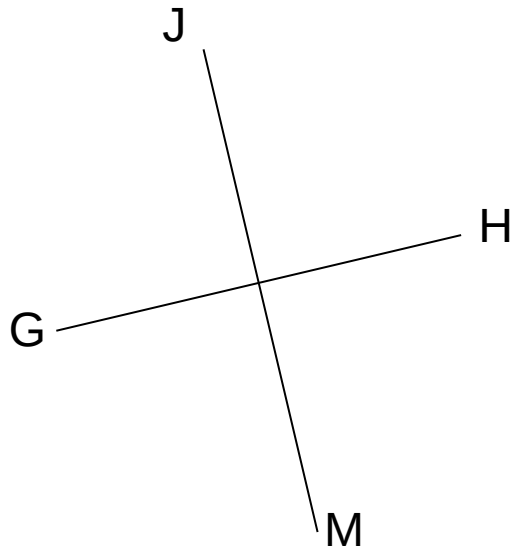
Definition: Lines, rays, or segments that intersect at right angles are perpendicular.

Perpendicular:

- Lines, Rays, or Segments that intersect at right angles
- Examples:

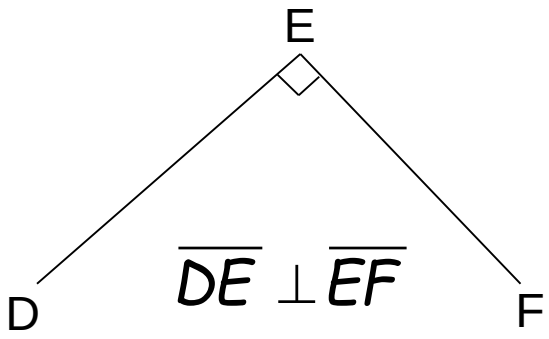


$\overleftrightarrow{a} \perp \overleftrightarrow{b}$



$\overline{JM} \perp \overline{GH}$

**In $\overline{DE} \perp \overline{EF}$ the little mark inside the angle (L) indicates <DEF is a right angle. **



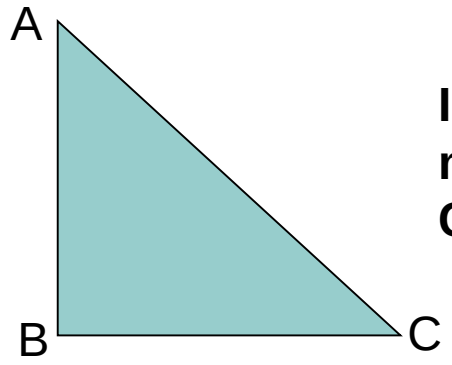
$\overline{DE} \perp \overline{EF}$

**This also means

m<DEF = 90°**

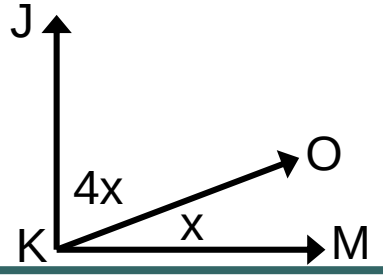
Can we assume a right angle??

- NO!!!!!
- Therefore, you cannot assume perpendicularity from a diagram either.



In $\triangle ABC$ it appears that $\overline{AB} \perp \overline{BC}$ BUT, we must be given this or be able to prove it, you CANNOT ASSUME it.

Example 1:



- Given: $\overrightarrow{KJ} \perp \overrightarrow{KM}$

  $m\angle JKO$ is 4 times as large as $m\angle MKO$

Find: $m\angle JKO$

**Since $\overrightarrow{KJ} \perp \overrightarrow{KM}$, $m\angle JKO + m\angle MKO = 90°$ **

$$4x + x = 90$$
$$5x = 90$$
$$x = 18$$

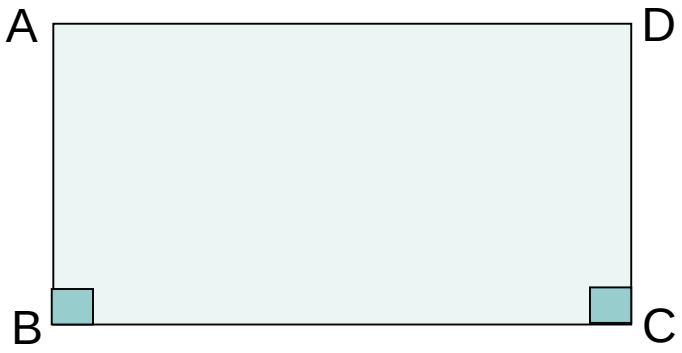
$$m\angle JKO = 4x$$
$$= 4(18)$$
$$= 72°$$

Example 2:

Given: $\overline{AB} \perp \overline{BC}$

$\overline{DC} \perp \overline{BC}$

Prove: $\angle B \cong \angle C$



Statement	Reason
1. $\overline{AB} \perp \overline{BC}$ $\overline{DC} \perp \overline{BC}$	1. Given
2. <ABC is right angle <DCB is right angle	2. If 2 segs. are perpendicular, then they form a right angle
3. $\angle B \cong \angle C$	3. If 2 angles are right angles, then they are congruent. (or just Theorem 1)