5. Consider the diagram yet again, and suppose that $\overline{BD} \parallel \overline{EH}$ while $\overline{AJ} \perp \overline{CG}$. If $m(\angle IFJ) = 15^\circ$ and $m(\angle ACD) = 40^\circ$, find the measurements of the following angles, clearly explaining how you know in each case.

- **$\angle CGF$**
  - $50^\circ$
  - $\angle CGF$ is a right angle because $\overline{AJ} \perp \overline{CG}$.
  - $\angle CFG$ and $\angle ACD$ are corresponding angles, so both measure $40^\circ$.
  - $\angle CGF$ is the remaining angle of $\triangle CGF$, so it measures $180^\circ - (90^\circ + 40^\circ) = 50^\circ$.

- **$\angle CGH$**
  - $130^\circ$
  - $\angle CGH$ is supplementary to $\angle CGF$ (they form a linear pair), so $m(\angle CGH) = 130^\circ$.

- **$\angle EFI$**
  - $25^\circ$
  - $\angle EFI$ and $\angle ACD$ are alternate exterior angles, so both measure $40^\circ$.
  - $\angle IFJ$ takes up $15^\circ$ worth of $\angle EFI$, so $\angle EFI$ makes up the remaining $25^\circ$.

6. If $A$ is in Quadrant II of the plane and $B$ is in Quadrant III, where in the plane could the midpoint of $\overline{AB}$ be? Show work or a supporting diagram, but you need not explain.