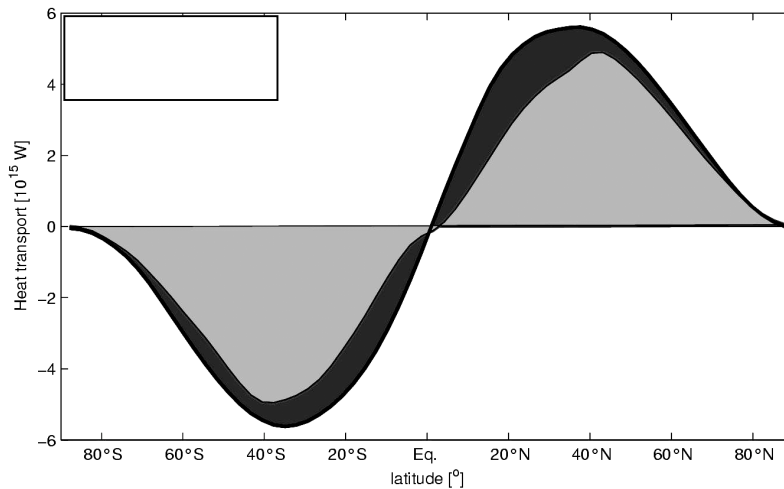


Name _____

2) (25 points) Heat Transfer: We have discovered that the heat flux balance at the top of the atmosphere is not zero for each latitude on the globe. This can only be true if heat is moved within our planet. The figure below gives you an estimate of the northward heat transport which in both hemispheres is directed from the equator to the pole.



- How big is the maximum equator to pole heat transport and at which latitude does it occur?
- There is a gray and a black shaded area on the graph. Label on the graph which heat transport each shaded region is representing? Which one is larger by about how much?
- Give an example/explain how the atmosphere is moving heat from the tropics to the pole. (include a sketch)
- Give an example of how the ocean can move heat from the tropics to the pole. (include a sketch) .

3) (25 points) Climate Variability: The Pacific Ocean is the largest ocean basin on the globe. In particular its extent along the equator covers almost half of the globe.

- a) Explain the two extreme states of the ENSO climate phenomena. Be sure to mention conditions in the ocean and atmosphere.
- b) Make a sketch of each of the states in the z-x plane (meaning up/down from 500m depth in the ocean to 8km height in the atmosphere along the equator from Indonesia to S. America)
- c) (not given yet)