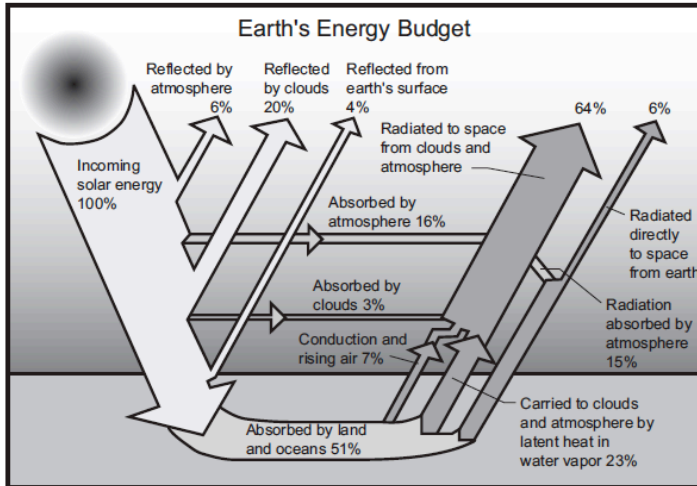


1. Supply representative percentages in the diagram below.



2. A satellite is launched such that it remains overhead at a specified longitude, a so-called geostationary orbit.

- determine the altitude of the satellite (show work).
- At this altitude, what angle does the Earth subtend when viewed from the satellite?

3. Kohler curves indicate the relative humidity in equilibrium next to a liquid water droplet as a function of its radius. Provide the derivation of the Kohler curve for a pure water drop. How do aerosols modify the curve from that for a pure water drop and why?

4. A pot with 1 kg of ice at -10°C is placed on a stove burner providing 900W of power. Ignoring the pot and any other heat losses, how long does it take to:

- melt the ice
- raise the water temperature to boiling
- boil the water away

5. To a first approximation, atmospheric density decays exponentially with height. What does this imply about solar transmission through our atmosphere at the near-infrared wavelengths? Derive an atmospheric optical depth. (hint: use a scale height H).

6. consider an initial spectrum of droplets of different sizes. How would you expect the droplet distribution width to change with time through a) condensational growth alone and b) collision-coalescence growth alone. (ie compare and contrast the growth expectances of the larger and smaller drops to each other).