

## **ATOC 5050: Atmospheric dynamics**

### Exercise 5

(due in class Thursday 22 September)

**0a)** Thought experiment: Argue why surface of potential temperature slope upward toward the poles. (I.e., what are the temperature and pressure variations that cause this?)

**0b)** Definition check: Why is motion that conserved potential temperature called isentropic? (I.e., can derive an expression for entropy as a function of potential temperature?)

**1)** Holton 2.5

**2)** Holton 2.10

**3)** Derive an expression of the lapse rate of an air parcel that undergoes adiabatic expansion as it is lifted upwards in the atmosphere. (i.e., what is the adiabatic lapse rate?)