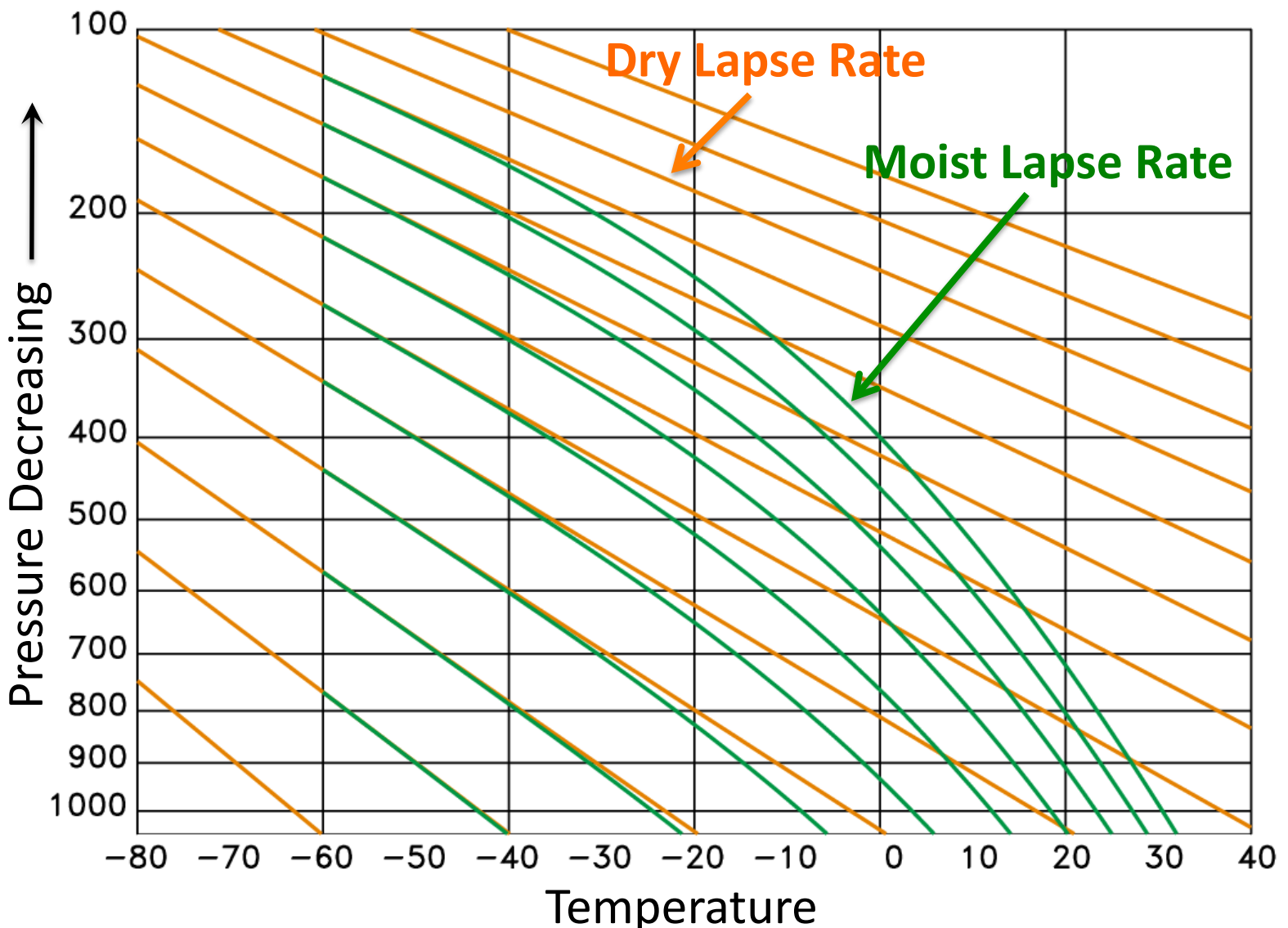


Determining Stability from Profiles of Temperature and Humidity (Extend Piece, Wed. 7/13/11)

- Parcel follows dry lapse rate line if unsaturated (“dry”)
- Follows moist lapse rate line if saturated (“moist”)



Discussion Questions

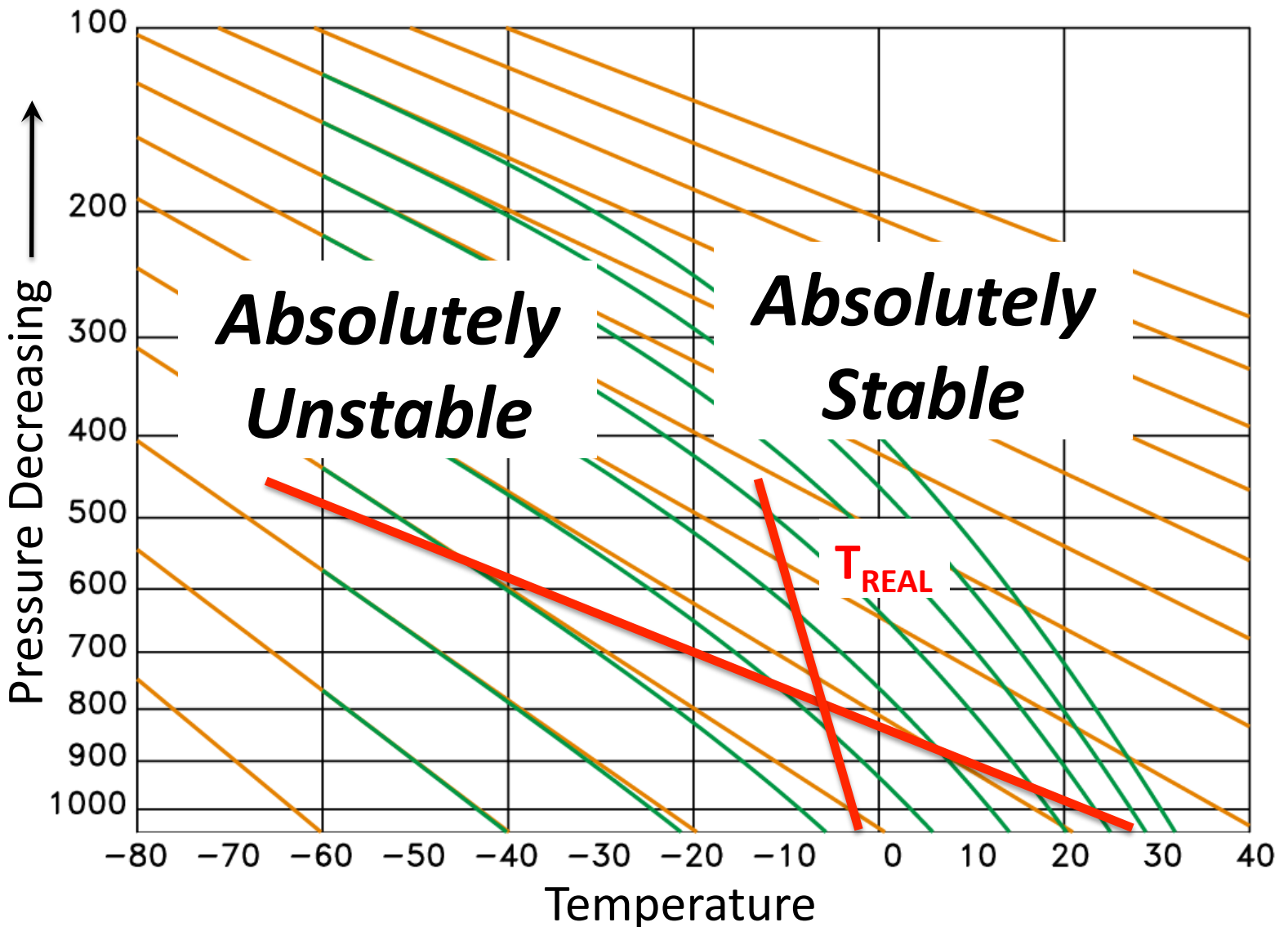
1. How are the lapse rate lines different?

- Moist lapse rate line is more vertical – lower rate of change of temperature with height

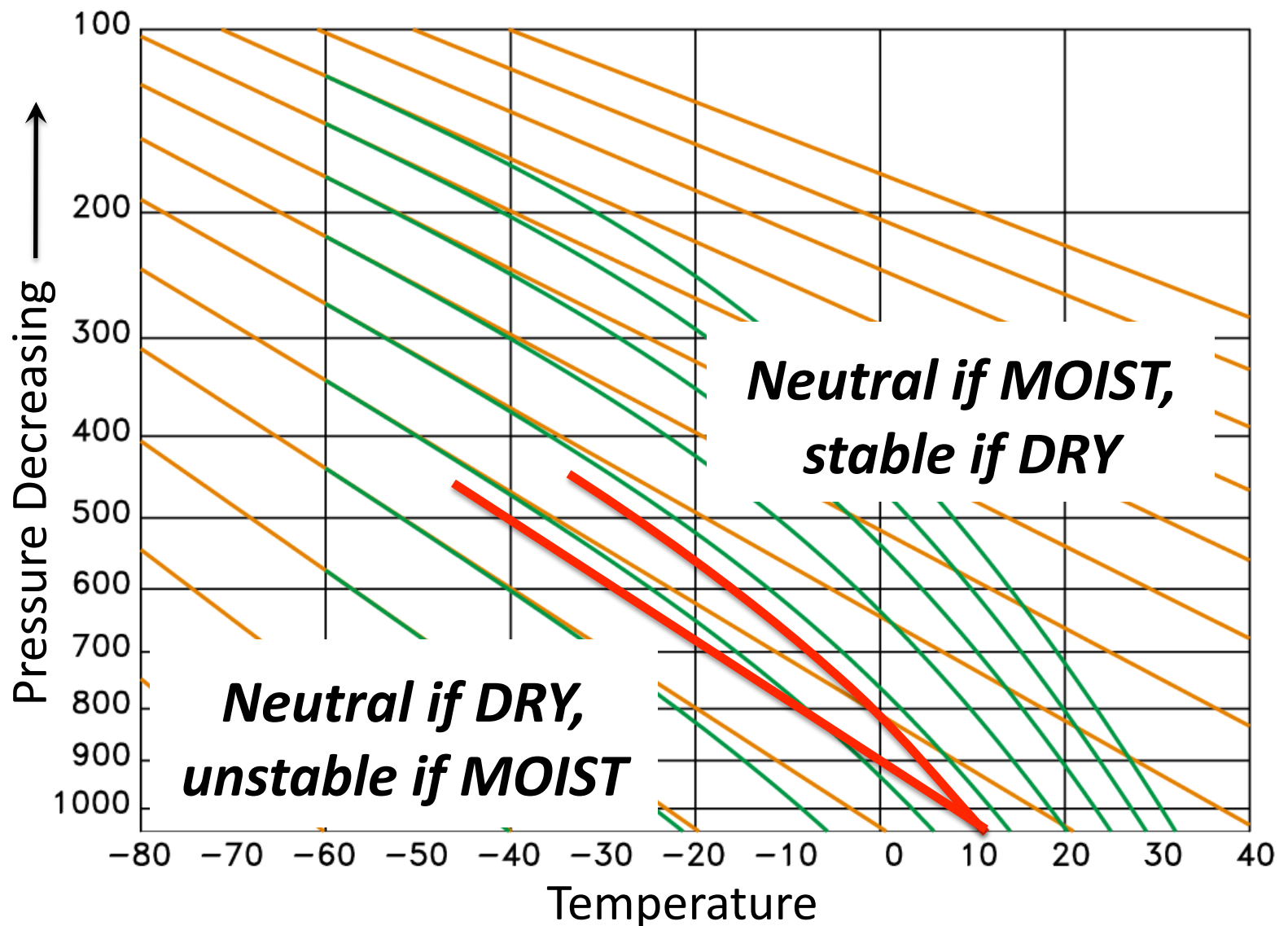
2. Why does this difference exist?

- If parcel is saturated (RH=100%), parcel becomes “moist” as pressure continues to decrease since water vapor is condensing into liquid
- Condensation releases latent heat, allowing the parcel to stay warmer than the dry lapse rate

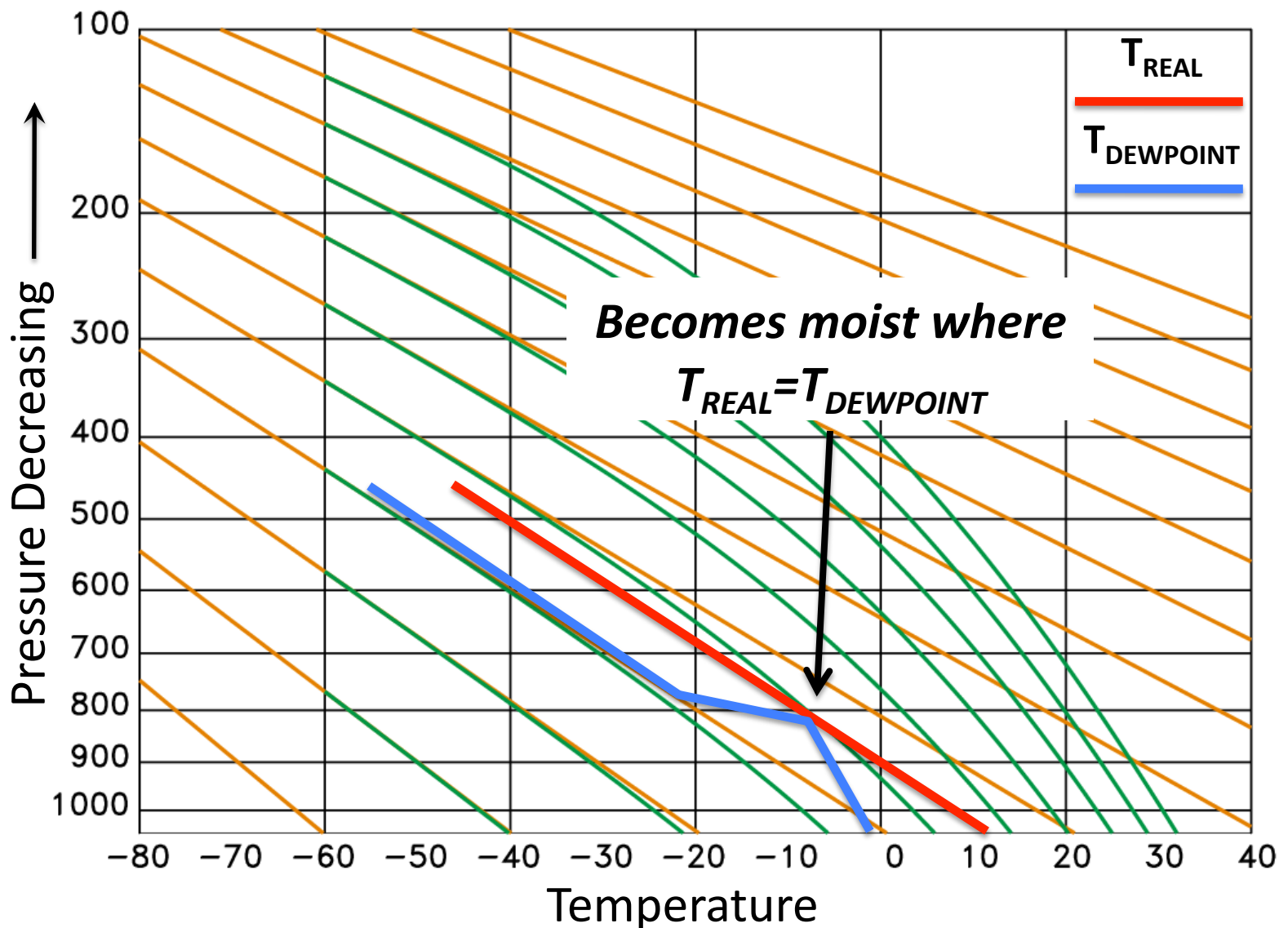
Stability from T_{REAL} and Moisture Variable



Stability from T_{REAL} and Moisture Variable

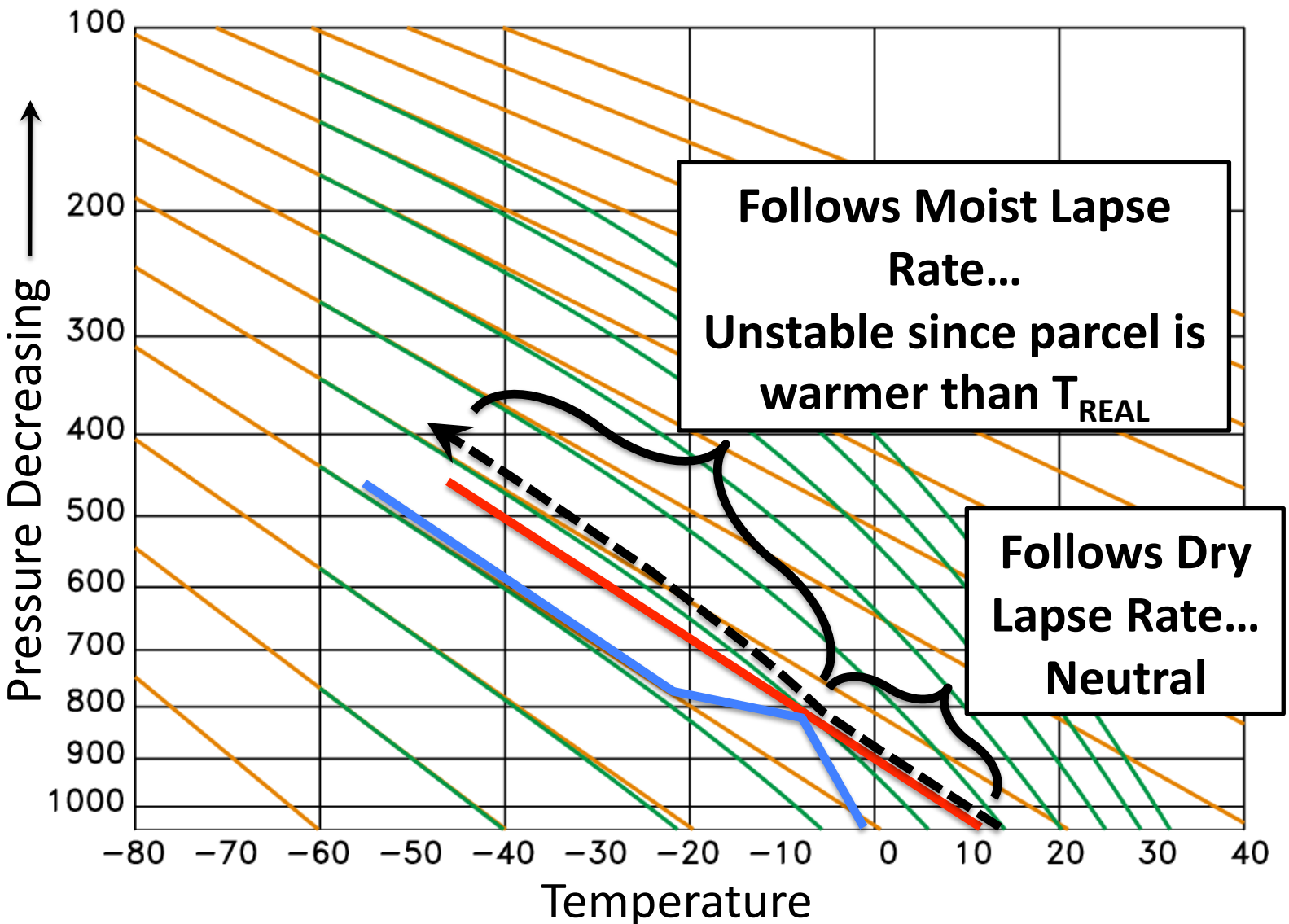


Use dewpoint temperature
(measured by sounding) to
determine whether moist or dry:
MOIST (saturated) when
RH=100%, when $T_{\text{REAL}} = T_{\text{DEWPOINT}}$

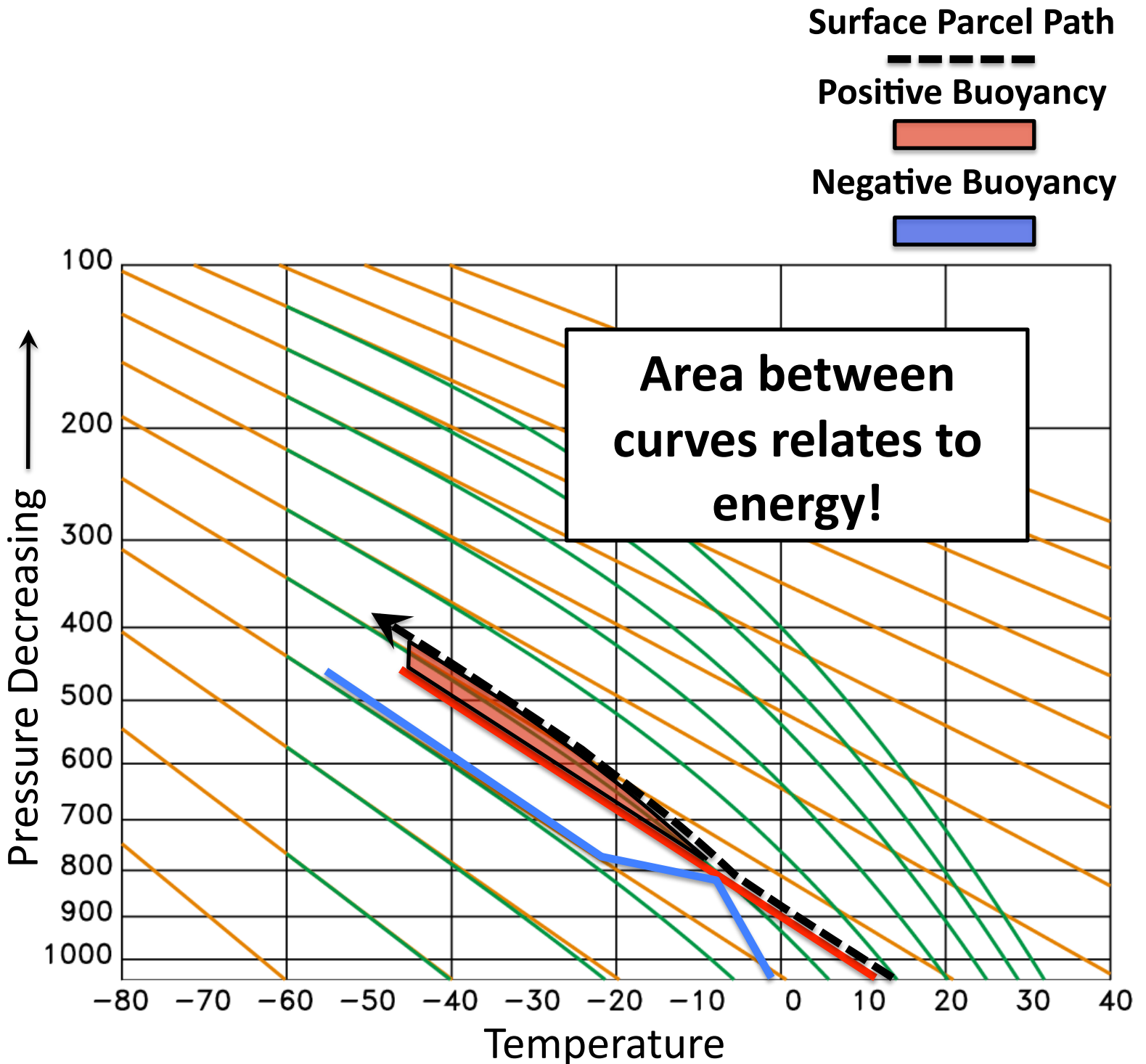


Stability from T_{REAL} and Moisture Variable

Surface Parcel Path



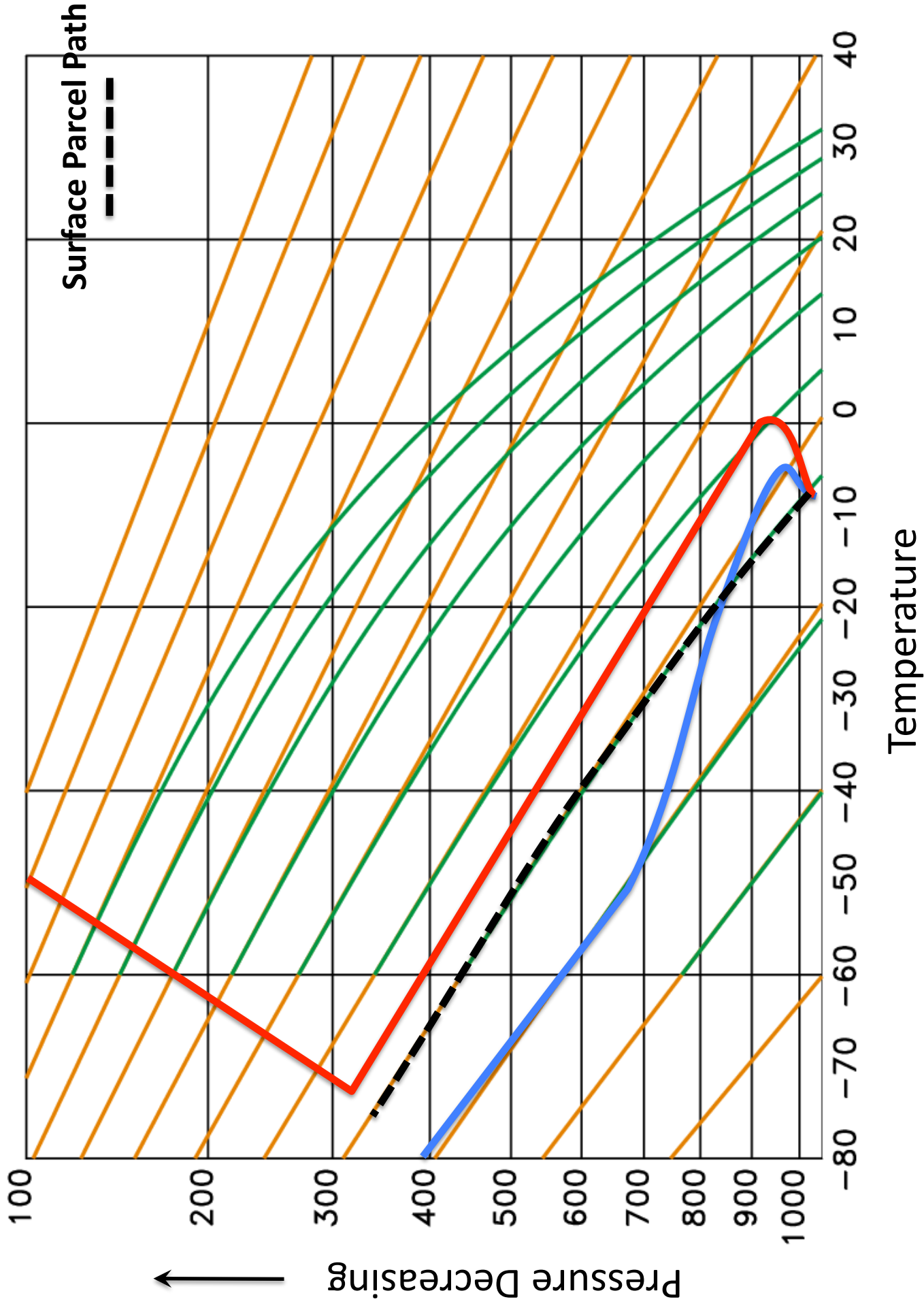
Stability from T_{REAL} and Moisture Variable



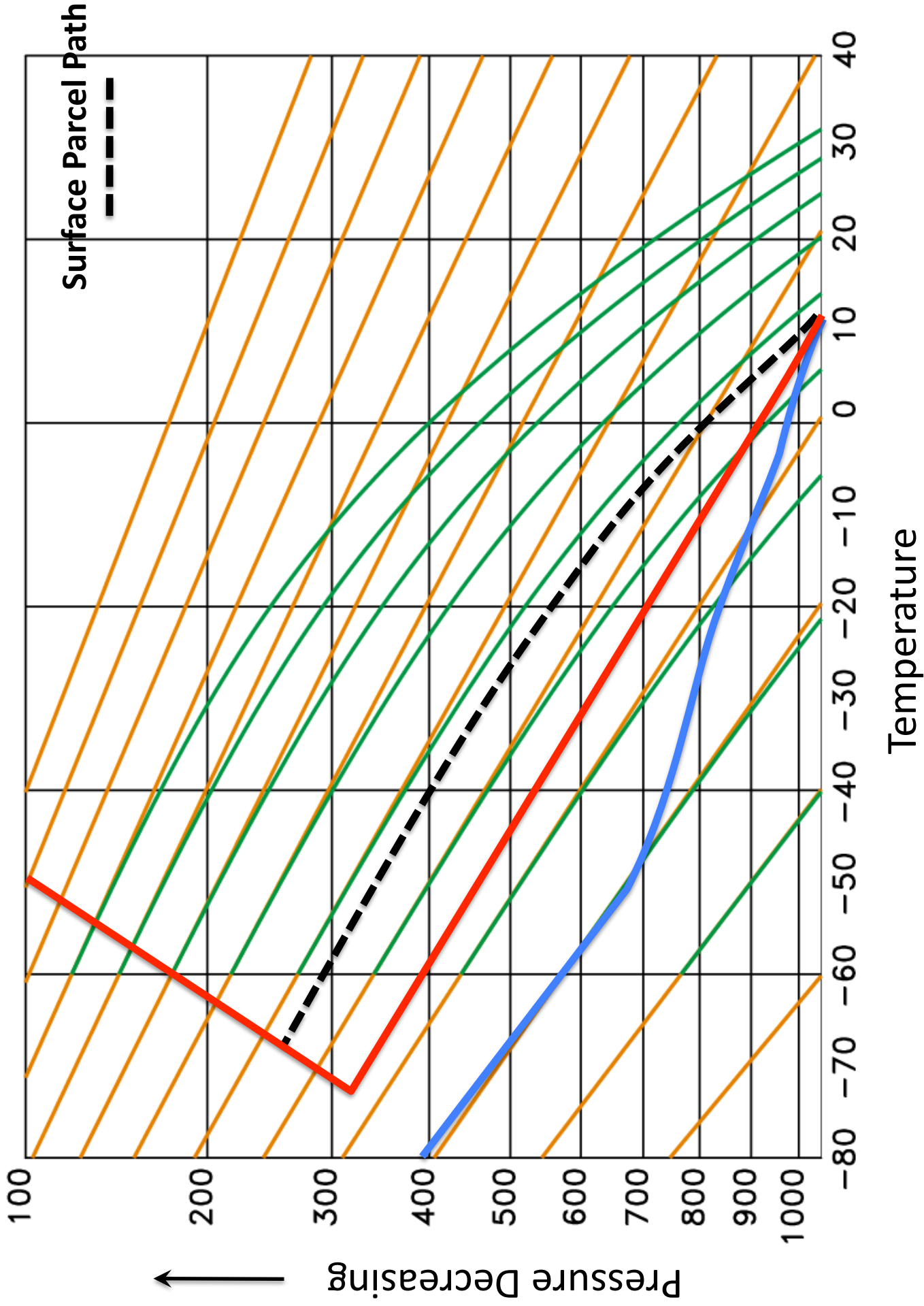
Exercise

Directions: Fill in the areas between the curves (T_{REAL} and Parcel Path) with either red or blue, depending on whether it is positive or negative buoyancy (respectively). Then match the profiles to the pictures.

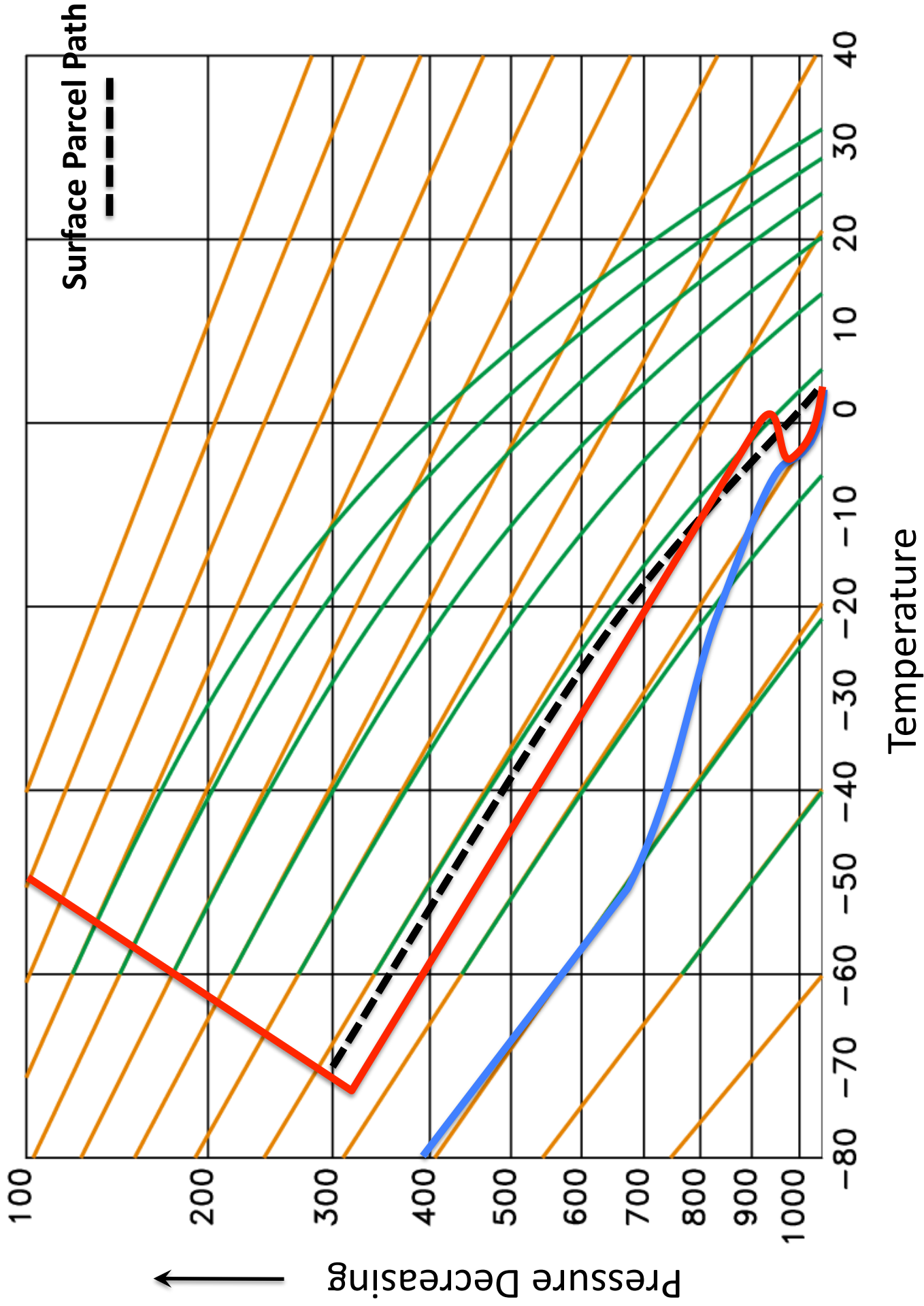
Exercise Profile 1



Exercise Profile 2



Exercise Profile 3



Exercise Photos

A



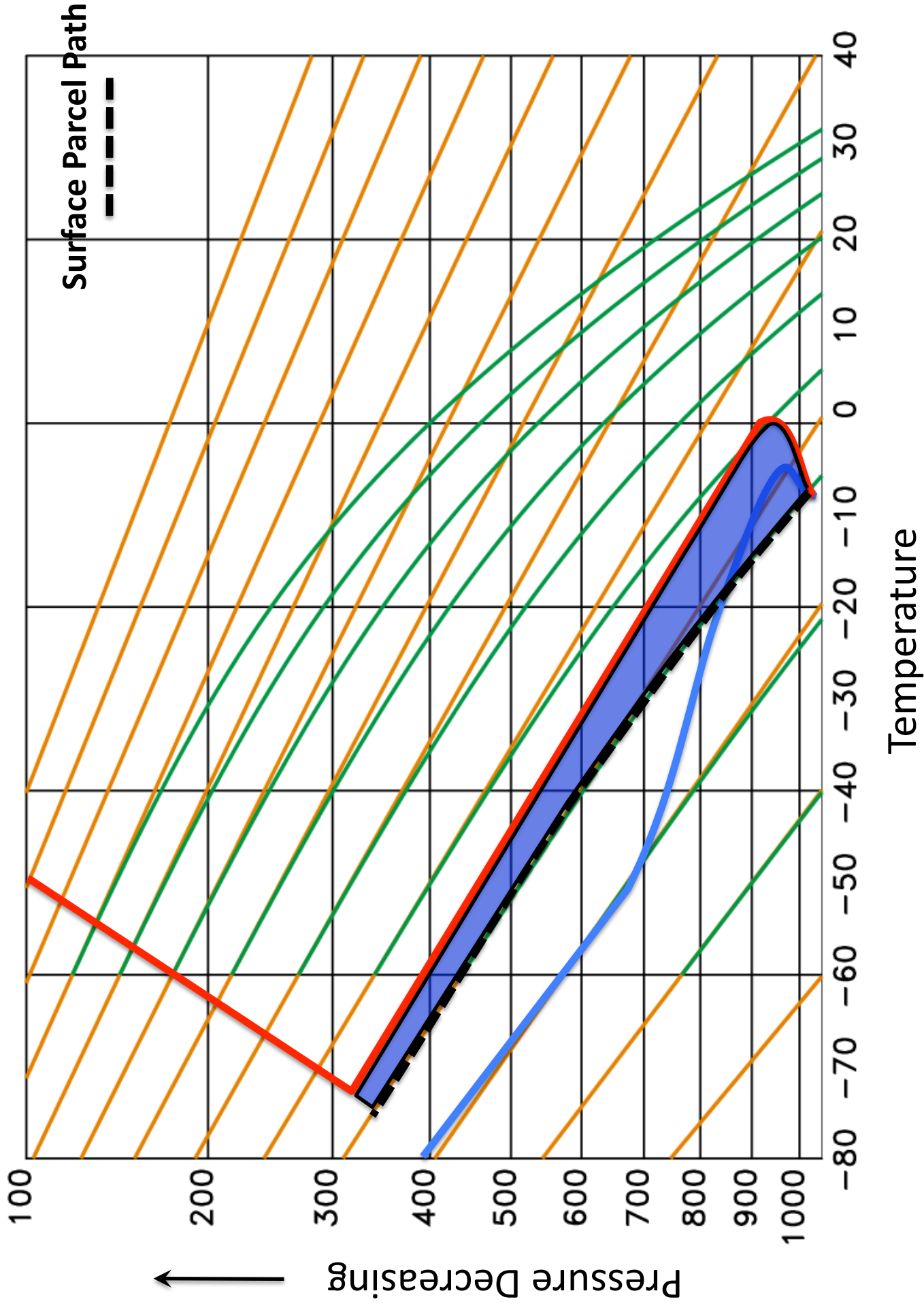
B



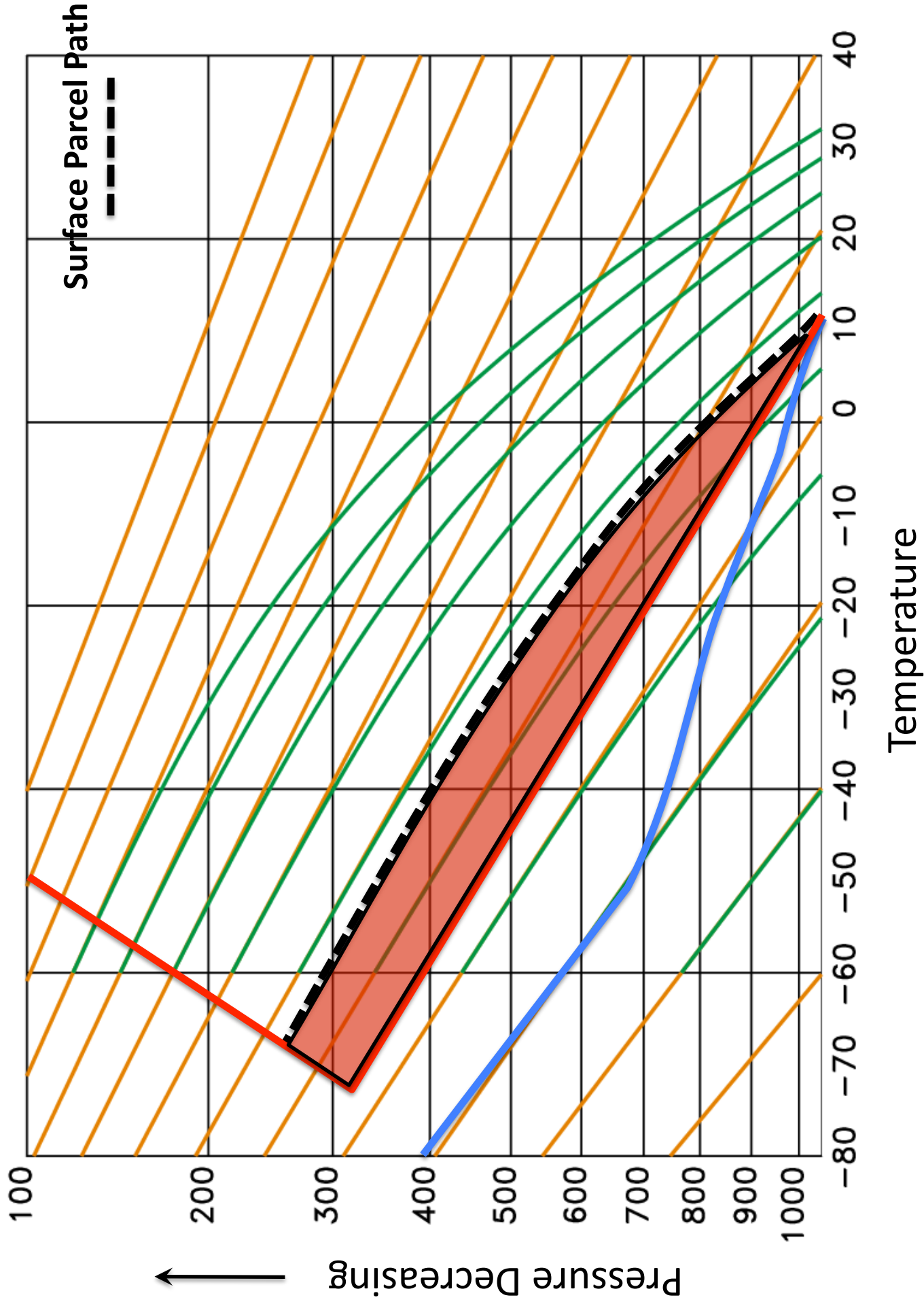
C

Solutions

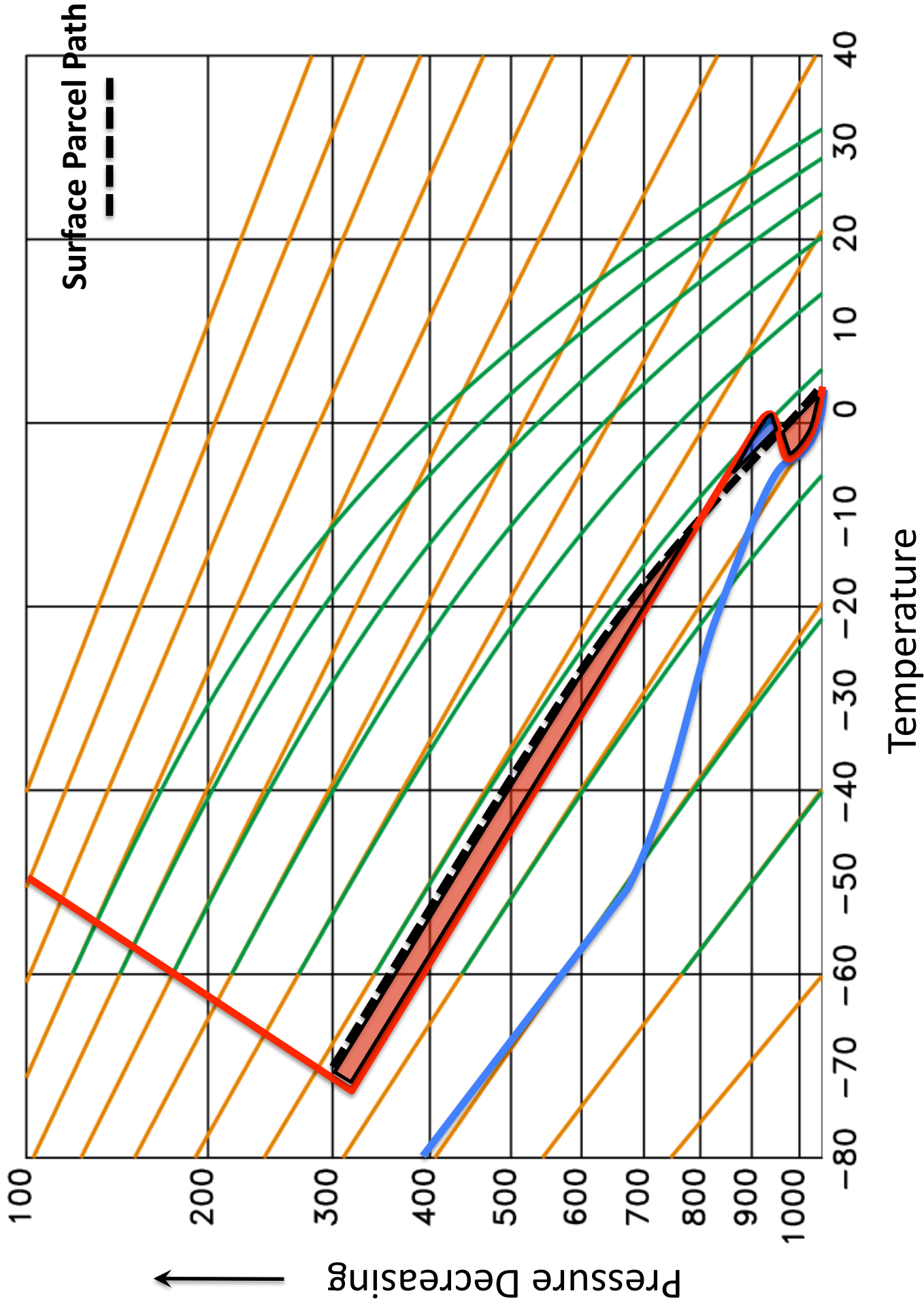
Exercise Profile 1 Solution



Exercise Profile 2 Solution



Exercise Profile 3 Solution

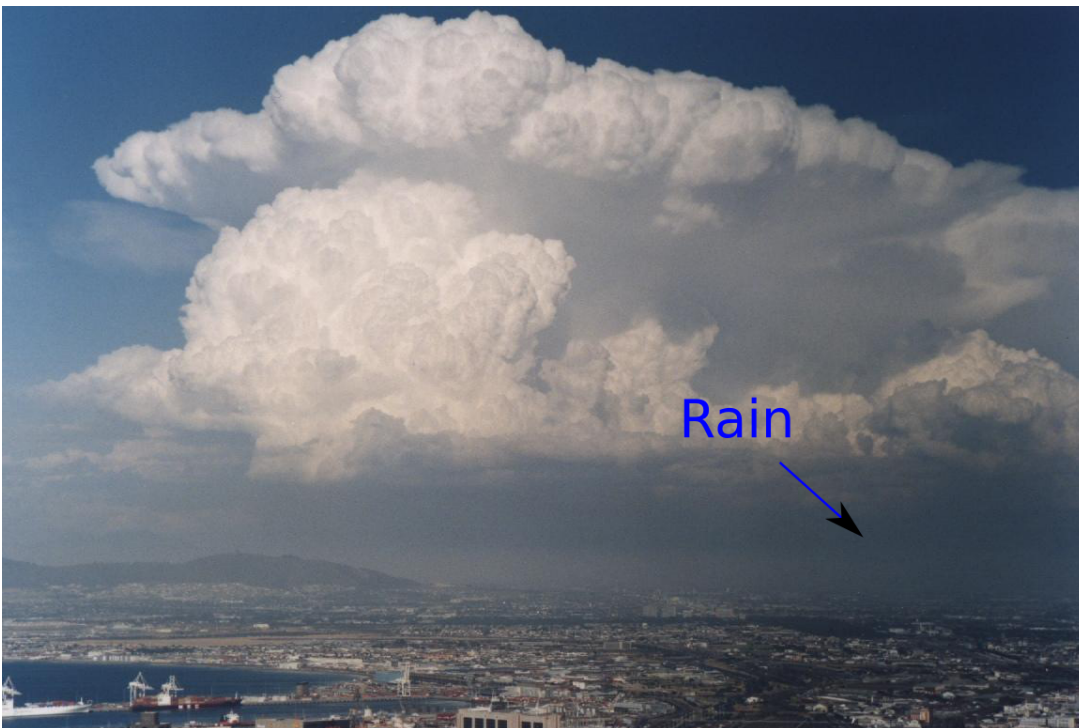
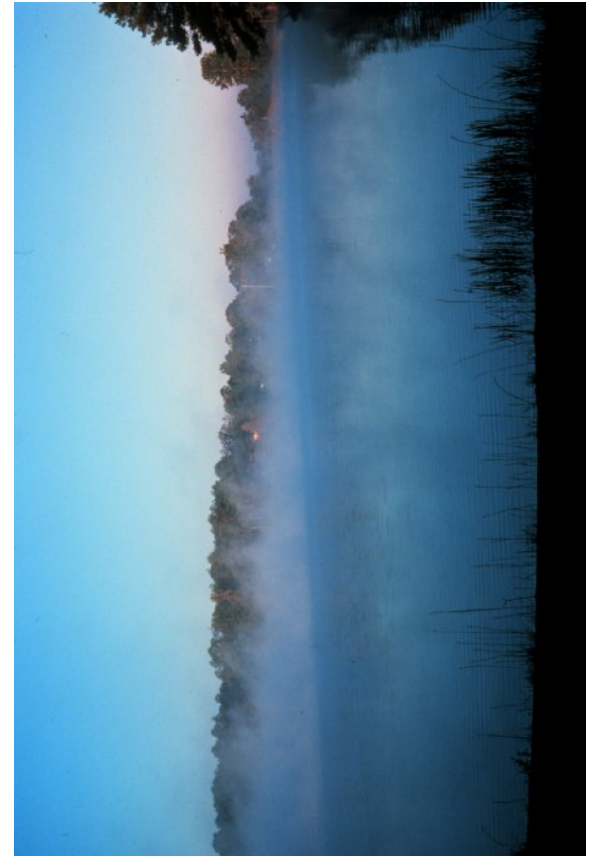


Exercise Answers

A – Profile 3



B – Profile 1



C – Profile 2