Why does humidity feel different in the winter?

A. During the winter, frost tends to form overnight. List the common atmospheric gases and justify why frost is most likely made of water. Suggest what phase transformation(s) could form frost.
   a. *Having trouble? Review questions from Chapter 8: 102 and Chapter 10: 27.*

B. Explain why the maximum vapor pressures and enthalpies of vaporization are different for the afternoon high temperatures in the winter versus the summer in Philadelphia.
   a. *Having trouble? Review questions from Chapter 10: 35, 37, and 47.*

	Winter High	Summer High
Temperature	41 °F	87 °F
Vapor Pressure	6.5 mmHg	31.8 mmHg
Enthalpy of Vaporization	44.8 kJ/mol	43.7 kJ/mol

C. Humidity is the percentage of partial pressure of water in air over the total possible water in the air. On the first day of the spring semester the humidity was 72%, but it did not feel humid outside. Calculate the partial pressure of water in air at this time and justify why it did not feel humid. *You may find it helpful to compare the first day of the spring semester to the first day of the fall semester, where the humidity was 89% on the first day of class.*

D. Much of the humidity in the air comes from vaporization from large bodies of water, like the Schuylkill and Delaware Rivers. Assuming the area of Temple's main campus is 4.1×10^3 m^2 and the height of the campus is 89.1 m (top of Morgan Hall), calculate the energy needed to reach 72% humidity by vaporizing water from the rivers at the winter high temperature. *(For the sake of this exercise, assume ideal gas applies.)*
   a. *Having trouble? Review questions from Chapter 10: 51.*

E. Imagine you are exercising at one of the campus gyms, you work up a sweat and exit the gym area into a hallway. As you may experience, a person who is sweating in a humid area will feel very cold when they go to a non-humid area. If the humidity in the gym is 80% and the humidity in the hallway is 40%, justify why you feel cold *without knowing the temperature of the building*.
   a. *Having trouble? Review questions from Chapter 10: 49, 61.*