Session 1
(Answers to Classroom Work Problems)

Refrigerants

- Classroom Problems – Use Refrigerant R134a Saturation Tables
  - T=40°F, P=40 psig
    - ✓ For P=40 psig, saturation temperature = 44.92°F
    - ✓ Actual temperature T=40°F < Saturation temperature
    - ✓ State – Sub-cooled Liquid
  - T=135°F, P=124 psig
    - ✓ For P=124 psig, saturation temperature = 99.89°F
    - ✓ Actual temperature T=135°F >> Saturation temperature
    - ✓ State – Superheated Vapor (Location - Compressor Discharge)
  - T=89.8, P=104 psig
    - ✓ For P=104 psig, saturation temperature = 89.8°F
    - ✓ Actual temperature T=89.8°F = Saturation temperature
    - ✓ State – Saturated conditions (could be liquid or vapor; Location – in condenser or upstream of expansion device if no sub-cooling)

Refrigerants

- Classroom Problems – Use Refrigerant R123 Saturation Tables
  - Determine saturation pressure for T=37.2°F
    - ✓ Saturation pressure = -9.18 psig = 5.52 psia
  - Determine saturation pressure for T=100°F
    - ✓ Saturation pressure ~ 6.10 psig

Refrigerants

- Classroom Problems – Use Refrigerant R134a Saturation Tables
  - Determine density, volume and latent heat of vaporization at the following state point: P=36 psig
    - ✓ All saturated conditions
    - ✓ Liquid density = 79.81 lb/ft^3
    - ✓ Vapor volume = 0.9364 ft^3/lb
    - ✓ Liquid enthalpy = 25.17 Btu/lb
    - ✓ Vapor enthalpy = 108.90 Btu/lb
    - ✓ Latent heat = Vapor enthalpy – Liquid enthalpy
      = 108.90 – 25.17
      = 83.73 Btu/lb