1. Saturation pressure of water at 100 degrees C (two decimals, kPa)?

   _____ kPa

2. Isobaric work 200 kPa, 0.3 to 0.9 m3 (one decimal, kJ)?

   _____ kJ

3. Isentropic turbine exit quality at 50 kPa (four decimals)?

   _____

4. Carnot efficiency between 800 K and 300 K (three decimals)?

   _____

5. Baseline turbine exit quality at 10 kPa (four decimals)?

   _____

6. The coefficient of performance is defined as:

   ☐ cost over benefit - w_in divided by q_L

   ☐ work out over heat in, like an engine

   ☐ the ratio of the two absolute temperatures

   ☐ benefit over cost - q_L or q_H divided by w_in

7. Inside the saturation dome, quality x is:

   ☐ the temperature span across the dome

   ☐ the ratio of actual to saturation pressure

   ☐ the vapour mass fraction of the mixture

   ☐ the vapour volume fraction of the mixture

8. Which of these is a state function?

   ☐ Boundary work

   ☐ Shaft work

   ☐ Enthalpy

   ☐ Heat transferred

9. Across an adiabatic nozzle with no shaft work:

   ☐ entropy stays exactly constant

   ☐ enthalpy drops by the kinetic-energy gain

   ☐ pressure stays constant

10. ds = delta q / T may be applied directly when:

    ☐ the fluid is an ideal gas

    ☐ the path is reversible - otherwise use the entropy balance with sigma

    ☐ the device is adiabatic

    ☐ the process is cyclic

1. **101.35 kPa**

   Read from the saturated-water temperature table.

2. **120.0 kJ**

   W = p dV.

3. **0.8966**

   x = (6.9212 - 1.0910)/6.5029.

4. **0.625**

   1 - 300/800.

5. **0.7227**

   (6.0700 - 0.6492)/7.5009.

6. **benefit over cost - q_L or q_H divided by w_in**

   COP is benefit over cost; the reversed-Carnot bound caps it.

7. **the vapour mass fraction of the mixture**

   Quality is defined on a mass basis - averaging by volume is the classic slip.

8. **Enthalpy**

   Work and heat are path quantities; h = u + pv depends only on the state.

9. **enthalpy drops by the kinetic-energy gain**

   q - w = 0, so dh = -d(ke).

10. **the path is reversible - otherwise use the entropy balance with sigma**

    The definition needs q_rev; sigma catches the rest.