Tips for HW15

1. You can find m\_dot using (area \* Velocity) / specific volume. And if you treat air like an ideal gas you can calculate specific volume from *v* = (R\*T)/P. Will need to use Δh to find temperature change, where Δh = Cp(ΔT). Units are bad. Make sure to include gc. Your second pass through this problem, use the air tables to find enthalpies.
2. First Law should simplify down to h1 = h2. You should have enough information to calculate h2. Then you will need to use that to calculate the quality at state 1. If all goes well you will find state 1 as a 2-phase mixture.
3. Similar to problem 2, First Law should simplify to h1 = h2. You have enough information to identify state 1. At state 2 you know pressure and specific enthalpy. Use this to calculate the quality.

Use of EES

Feel free to use EES to do these problems. Or do them by hand and use EES to check your results. In EES, the substance “air” is what you would find in the air tables – you only need to specify a temperature to call out values for specific volume and specific internal energy. If you want higher accuracy, you can use “air\_ha” and specify two independent intensive properties to define your state.

If you choose to do the problem using EES, remember that you should be capable of doing your full engineering documentation when you print from EES. Alternatively, you can do a hand-written page of setup/check/reflection and use EES for the calculations/properties.