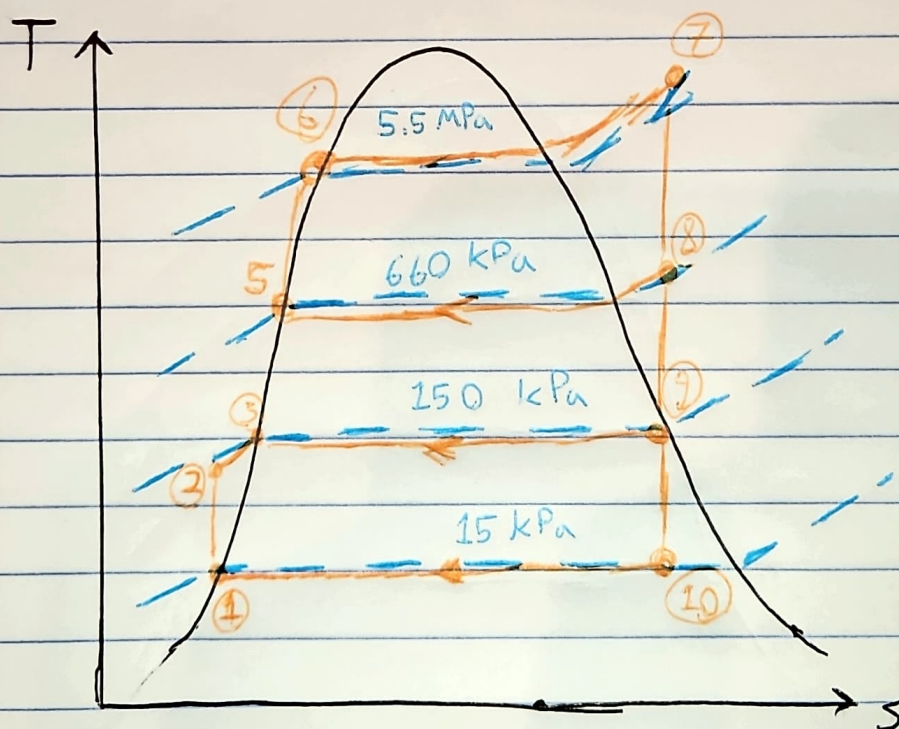
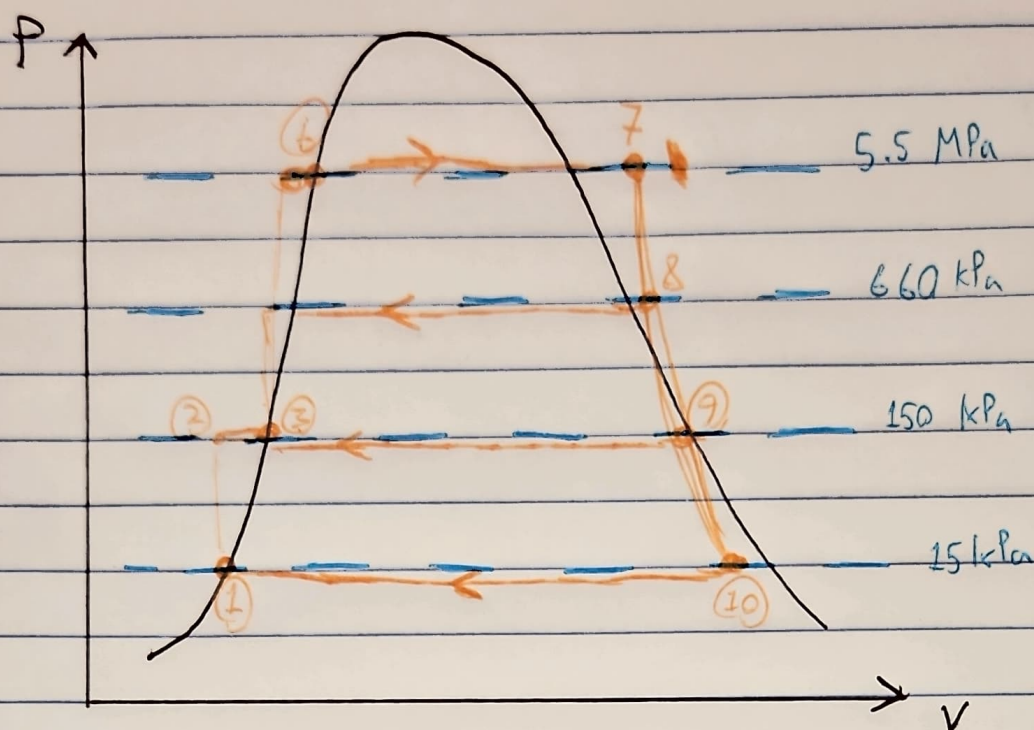
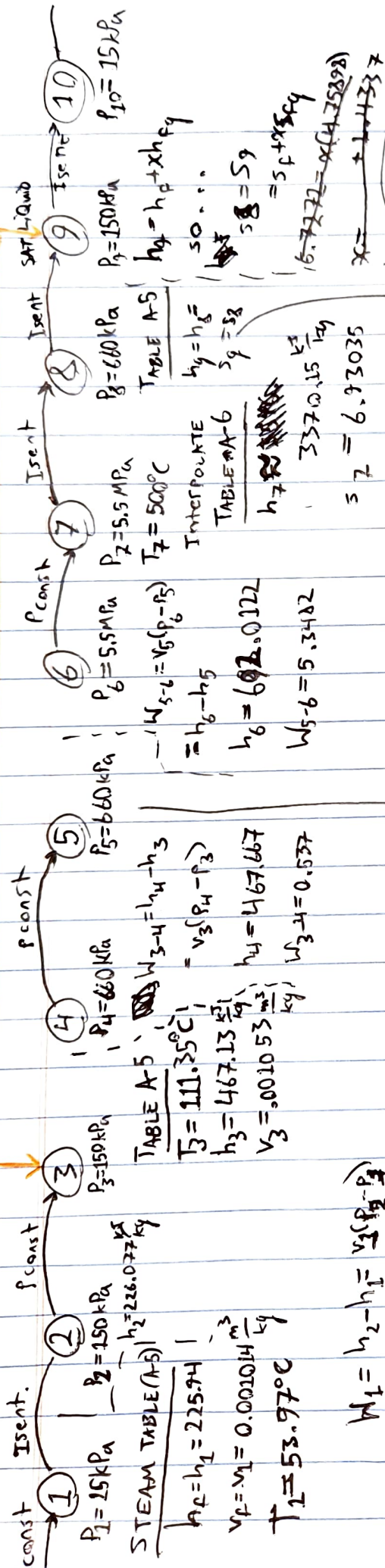


b) P-v and T-s diagrams





$$h_1 = h_2 - h_f = v_2(P_2 - P_1)$$

$$h_2 = 225.94 + [0.001014(135)]$$

$$W_{1-2} = 0.13689$$

$$h_2 = 226.0779 \frac{\text{kJ}}{\text{kg}}$$

No Specific @ 660 kPa  
USE INTERPOLATION w/ TABLE A-5

$$T_5 \approx 162.574^\circ\text{C}$$

$$h_5 \approx 686.664 \frac{\text{kJ}}{\text{kg}}$$

$$v_5 \approx 0.0011048 \frac{\text{m}^3}{\text{kg}}$$

or  
.001105

$$S_{10P} = 0.7549$$

$$S_{F9} = 7.2522$$

$$S_{10} = 0.7549$$

$$S_{F9} = 7.2522$$

$$S_{10} = 0.7549$$

$$S_{F9} = 7.2522$$

Interpolate  
TABLE A-5

$$h_8 \approx 2760.24$$

$$s_8 \approx 6.7272$$

$$h_9 = 467.13$$

$$s_9 = 59$$

$$s_8 = s_9 + x(s_9 - s_8)$$

$$x = 0.9143$$

$$h_9 = h_8 + x(h_9 - h_8)$$

$$h_9 = 2502.3618$$

$$h_9 = 2502.3618$$

a), c), and d)

$$Q_{in} = h_7 - h_6$$

$$Q_p = 0?$$

$$y_1 = y_2$$

↳ or  $\dot{m}$

$$3370.15 - 692.0122$$

1-2 $\gamma$  for step 9-20

$$Q_{in} = 2678.1378$$

FWH?  $\eta h_5 + (1-\gamma)h_4 = h_5$

$$\eta 2760.24 + (1-\gamma)(467.667) = 686.664$$

$$\gamma = 0.0955$$

$$\epsilon_u = \frac{W_{net} + Q_r}{Q_{in}} \quad \text{OR} \quad 1 - \frac{Q_{out}}{Q_{in}}$$

$$W_{net} = \underbrace{(h_7 - h_8)}_{\text{Turbine}} + \underbrace{(1-\gamma)(h_8 - h_9)} + \underbrace{(1-2\gamma)(h_9 - h_{10})}$$
$$609.76 + 233.25 + 261.170$$

$$W_{net} = 1104.182$$

d)  $\dot{m} = \frac{50000}{1104.182} = 45.28$