Problem: P310 – 5.2

a) Equation 5.10. $i = I_{sc} - I_0 (e^{38.9V} - 1)$

$$= 6.4 - 4\times10^{-11} (e^{38.9V} - 1) \quad V.$$

Equation 5.11: $V_{oc} = 0.0257 \ln\left(\frac{I_{sc}}{I_0} + 1\right)$

$$= 0.0257 \ln\left(\frac{6.4}{4\times10^{-11}} + 1\right)$$

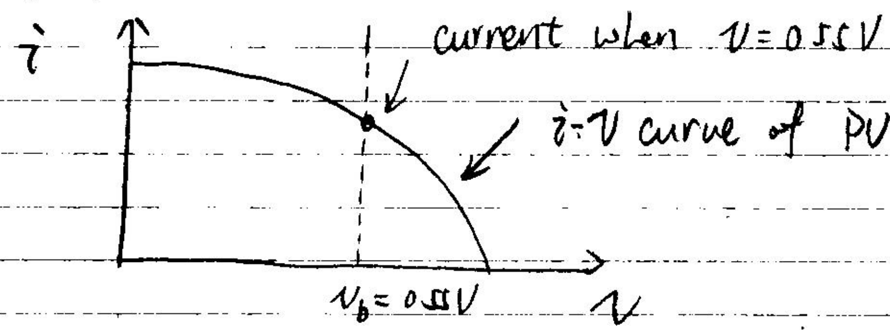
$$\approx 0.71 V$$

b) $i(V = 0.55) = 6.4 - 4\times10^{-11} (e^{38.9\times0.55} - 1)$

$\approx 6.32 A$

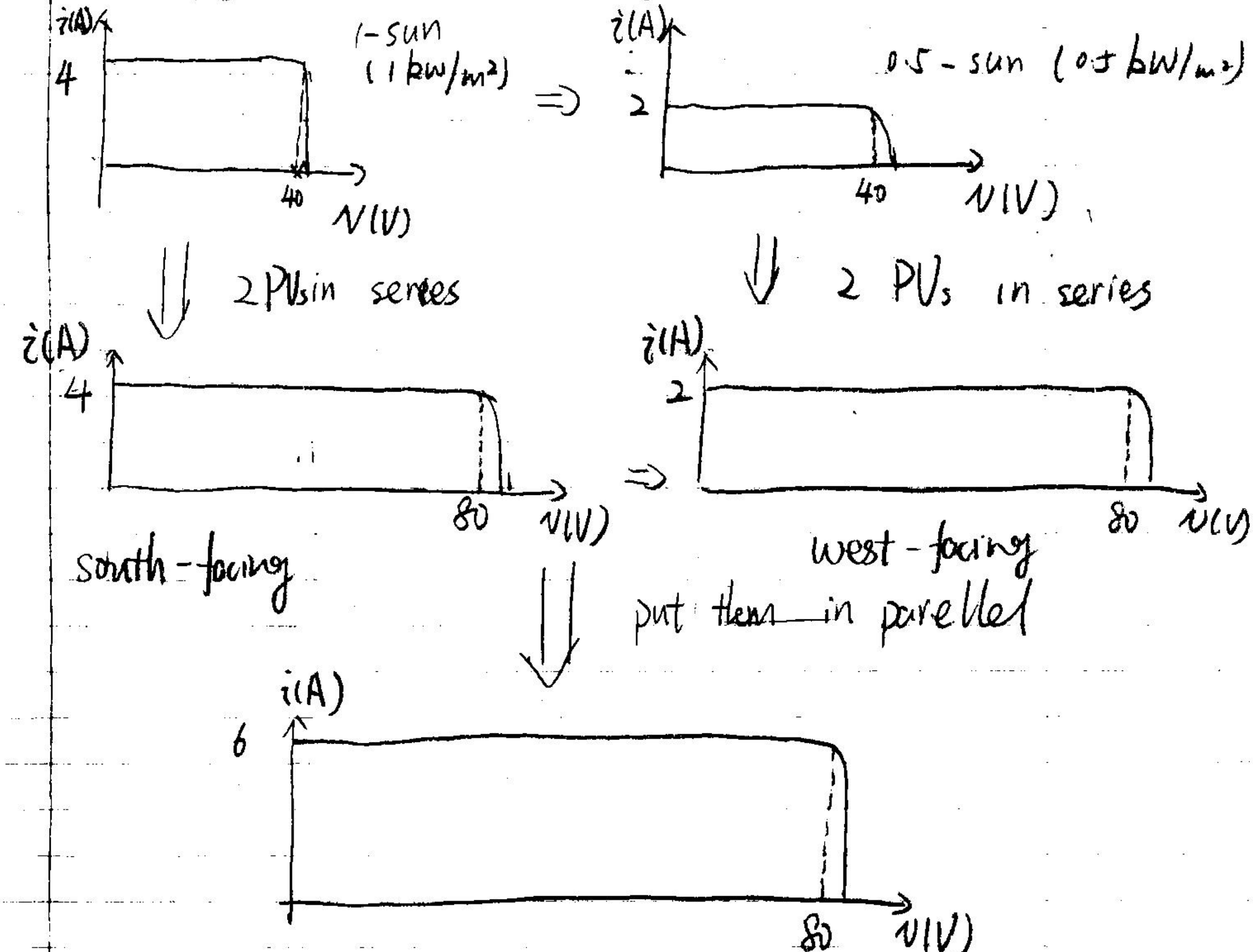
c) skip part c)

In this problem, if you're given the i-V curve instead of the equation, how can you determine the current in problem b) ?



Problem P312 - 5.8.

Please pay attention to the Figure in P319



MPP: $v = 80\,V$, $i = 6\,A$

$P_{max} = 480\,W$

In this problem, you're required to know how to derive the i-v curve of a PV array based on the i-v curves of smaller PV component

Problem :

for a PV , $i = f(v)$

for a resistor . $i = r \cdot v$

If you wanna solve the above equations graphically,

① draw the i-v curve of PV

② draw the i-v curve for the resistor.

③ the point where the above two curves intersect is the operating point of the PV