1. $P = Av^3 + \frac{BL^2}{v} \rightarrow \frac{dP}{dv} = P' = 3Av^2 - \frac{BL^2}{v^2}$

CP's: $P' = 0$ solve for v. get $v_P = \sqrt[4]{\frac{+BL^2}{3A}}$

2. $E = \frac{P}{v} = \frac{1}{v}\left(Av^3 + \frac{BL^2}{v}\right) = Av^2 + \frac{BL^2}{v^2}$

$\frac{dE}{dv} = E'(v) = 2Av - \frac{2BL^2}{v^3}$ set $= 0$ and solve for v.

get $v_E = \sqrt[4]{\frac{+BL^2}{A}}$

3. $\underbrace{\left(1 - \frac{1}{\sqrt[4]{3}}\right)}_{\approx 0.241\ldots} \sqrt[4]{\frac{BL^2}{A}}$ is the difference

4. verify.

5. $\frac{d\bar{P}}{dx} = A_w v^3 - \frac{Bm^2q^2}{vx^2}$ set $= 0$ and solve for x.

get $x_m = \sqrt{\frac{Bm^2q^2}{A_w v^4}}$

As $v\uparrow$ $x_m \downarrow$

6. $\bar{E} = \frac{\bar{P}}{v}$. $\frac{d\bar{E}}{dx} = 0$ get $x_{\bar{m}} = \sqrt{\frac{Bm^2q^2}{A_w v^4}}$