Supply, Producer Surplus, factor Surplus

$MC = $ marginal Cost

$$TVC = \int_0^q mc(x)\,dx$$

"Diminishing Returns to Fixed Factors"

$AVC = $ Average Variable Cost

$$\frac{TVC}{Q} = AVC$$

$TVC = $ total Variable Cost
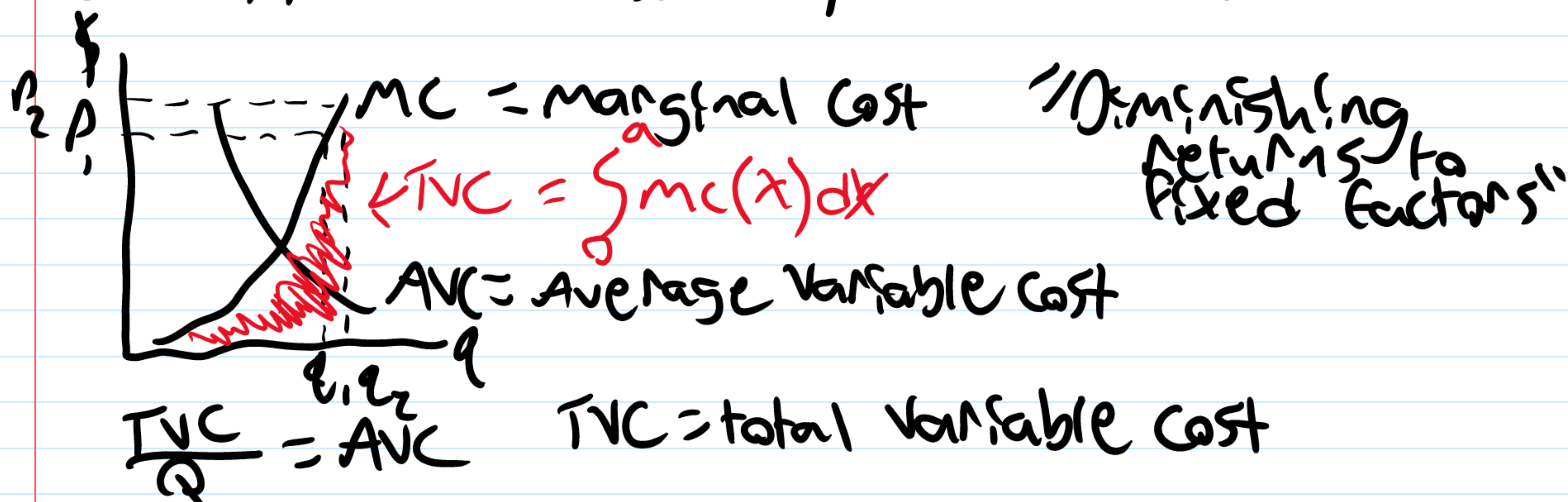
$$\pi = Pq - C(q) \rightarrow \frac{d\pi}{dq} = P - \boxed{\frac{dC}{dq}} = 0$$

↳ Profit   ↳ cost   ↳ MC

$$P - mc = 0$$
$$P = mc \rightarrow \text{see graph}$$

$$Q^S = \sum_{i=1}^{n} q_i (P)$$

↳ market supply
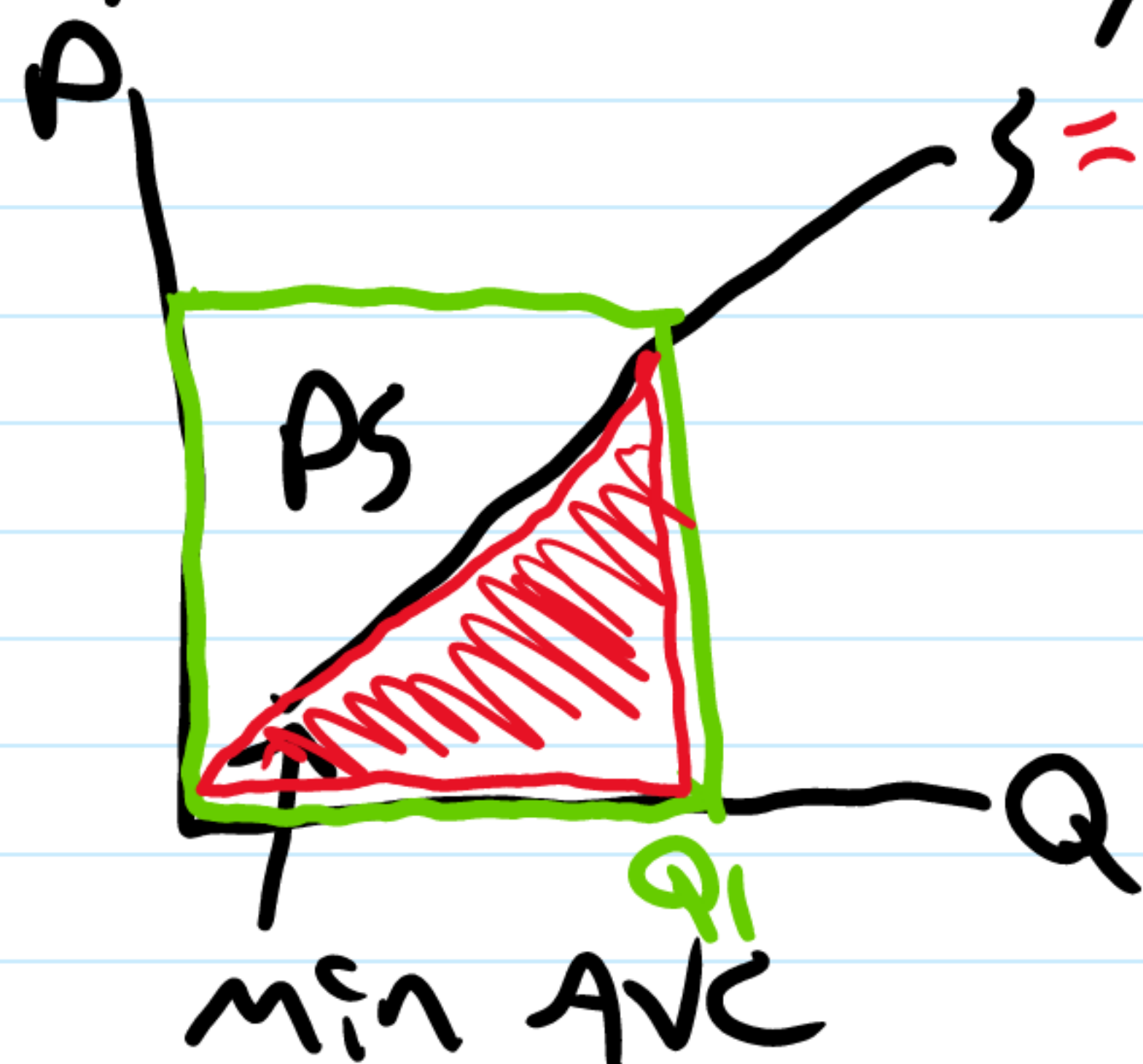
IVC $\pi = Pq - TVC - TFC$

$S = $ firm mc ↳ Total Fixed Cost

$$PS = Pq - TVC$$

↳ producer Surplus

min AVC

$$SS = CS + PS$$
Social = Consumer + Producer

Long run ⟷ All inputs are Variable