$q = N(\beta_0 + \beta_1 P) \rightarrow q/N = a - bP$

all else in a

$q = Nf(P)$ $\qquad\qquad f = q^d/N$

$\frac{dq}{dP} \cdot \frac{P}{q} = N\frac{df}{dP} \cdot \frac{P}{Nf(P)} \rightarrow \zeta = \frac{df}{dP} \cdot P/f$ $\qquad P^* = (\frac{\zeta}{1+\zeta})MC$

"Law of one Price"
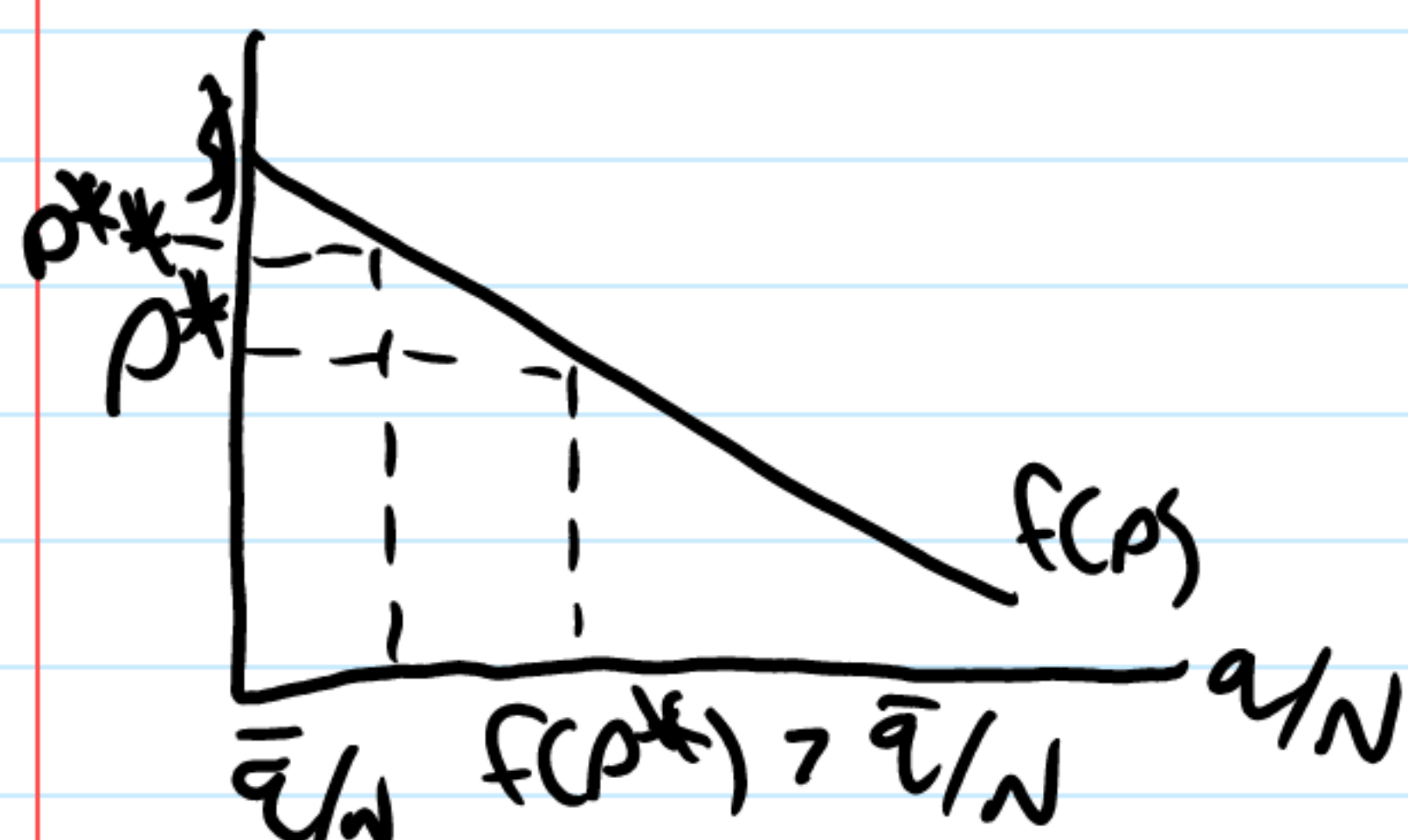
Example:

$N = 1000, \quad f(P) = 1 - .1P \quad MC = 2$

$\Pi = 1000 \left[P(1 - .1P) - 2(1 - .1P) \right]$
$\quad = 1000(P - 2)(1 - .1P)$
$\frac{d\Pi}{dP} = 1000(-.1(P-2) + 1(1 - .1P)) = 0$
$\quad .2 + 1 - .2P = 0$
$\quad .2P = 1.2$
$\qquad P = 6 \qquad\qquad f = 1 - .1 \cdot 6$
$\qquad q = 400 \qquad\qquad = .4$
$\qquad \Pi = (6-2) \cdot 400 - f$
$\qquad\quad = 1600 - f$

$\bar{q} = 200$
$f = 200/1000 = .2 \qquad\qquad\qquad .2 = 1 - .1P$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad .1P = .8$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad P = 8$

$\Pi = (8 - 2) \cdot 200 - f$
$\quad = 1200 - f$