$Q^d = 2000 - 10P$, $n = 40$.

$STC = q^2 + 50q + 100$.

(1) 廠商短期供給曲線.

$P > AVC$ 的 MC 曲線

$P = MC = 2q_1 + 50$

$AVC = q_1 + 50$.

$P > AVC$

$2q_1 + 50 > q_1 + 50$ (成立)

$p = 2q_1 + 50$

$q_1 = \frac{P}{2} - 25$ #

(2) 市場供給曲線

$Q = \sum_{1}^{40} q_1$

$= 40(\frac{P}{2} - 25)$

$= 20P - 1000$ #

(3) 市場均衡價格, 数量

$S = P$.

$20P - 1000 = 2000 - 10P$

$P^* = 100$, $Q^* = 1000$ #

(4) 廠商最適產量, 利潤

$q_1 = \frac{P}{2} - 25$

$= \frac{100}{2} - 25 = 25$ #

$TV = TR - TC$

$= 100 \cdot 25 - (25^2 + 50 \times 25 + 100)$

$= 525$ #

延伸 $Q^d = 3500 - 10P$, $STC = q_1^2 + 50q_1 + 100$, $n = 40$.

(1) $MC = 2q_1 + 50 = P$

$AVC = q_1 + 50$

$q_1 = \frac{P}{2} - 25$ #

(2) $Q = \sum_{1}^{40} q_1$

$= 20P - 1000$ #

(3) $20P - 1000 = 3500 - 10P$

$P^* = 150$, $Q^* = 2000$ #

(4) $q_1 = \frac{P}{2} - 25$

$= \frac{150}{2} - 25 = 50$ #

$TV = 150 \cdot 50 - (50^2 - 50 \cdot 50 + 100)$

$= 2400$ #