# Midterm Exam Solutions 2019 (Solutions of Questions not Discussed in Class)

Exercise 1

1. $MC = 4 + 4y$, $AVC = 4 + 2y$, $AFC = 2/y$.

2. Threshold for short-run shutdown: the price is below min $MC = 4$. (Note: you should state explicitly that the threshold is a price.)

3. Threshold for long-run shutdown: the price is below min $AC = 8$. One gets min AC by solving $AC(y) = MC(y)$ for y (which yields $y = 1$) and plugging this into AC: $AC(y = 1) = 8$.
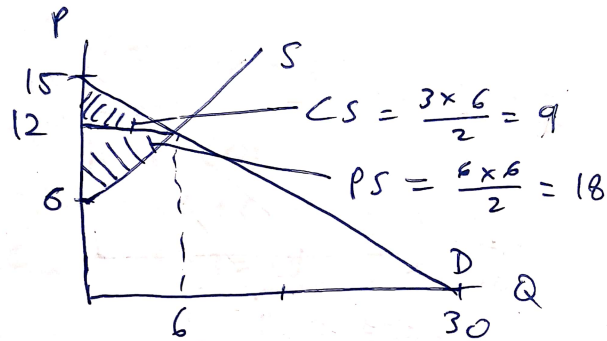
4. see figure:
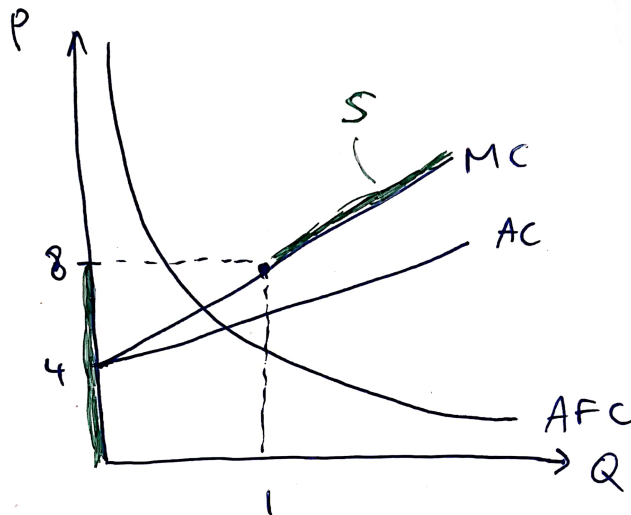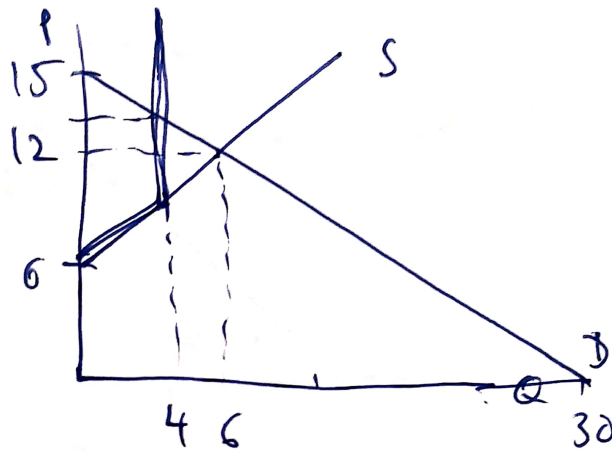

5. see S in figure above

6.
$$S(p) = \begin{cases} 0 & \text{if } p < 8 \\ 9p - 36 & \text{if } p \geq 8 \end{cases}$$
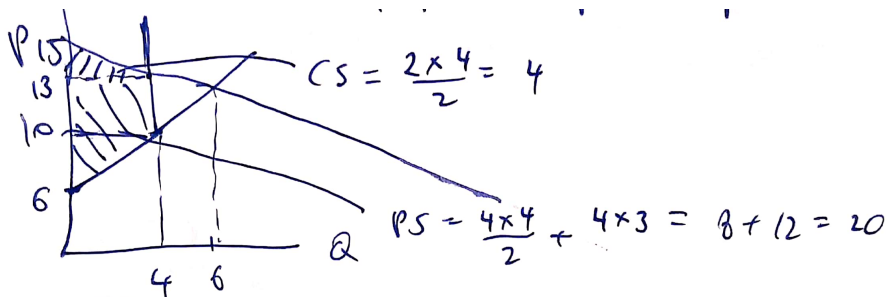
Exercise 2

1. $p = 12$, $q = 6$

2. $CS = 9$, $PS = 18$, see figure:

$$CS = \frac{3 \times 6}{2} = 9$$

$$PS = \frac{6 \times 6}{2} = 18$$

3. there is no deadweight loss, since the market equilibrium is efficient

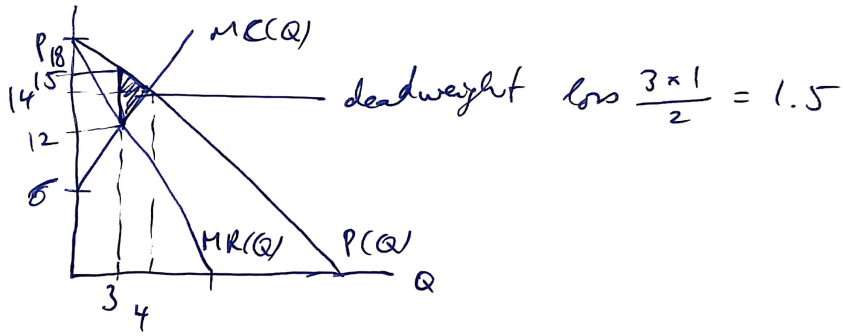4. quantity: $q = 4$, price: 13 (This can be computed by solving $Q_d(p) = 4$ for p.), see figure:

5. $CS = 4$, $PS = 20$, see figure:

$$CS = \frac{2 \times 4}{2} = 4$$

$$PS = \frac{4 \times 4}{2} + 4 \times 3 = 8 + 12 = 20$$

6. deadweight loss: (9+18)-(4+24)=3

Exercise 3

1. $AR(Q) = P(Q) = 18 - Q$, $MR(Q) = 18 - 2Q$, $MC(Q) = 2Q + 6$

2. $Q_m = 3$, $P_m = 15$ (obtained by solving $MC(Q_m) = MR(Q_m)$)

3. $Q_e = 4$, $P_e = 14$ (obtained by solving $MC(Q_e) = P(Q_e)$)

4. deadweight loss: 1.5, see figure:

5. the produced quantity is 3 like in the previous question, so the deadweight loss is also 1.5, see figure: