1. Demand Function for Firm A is given as the following:

$\log(QA) = 3.5 - 1.3 \cdot \log(PA) + 1.5 \cdot \log(PB)$

If the Firm B cut prices by 10%, then the PB should be 81. (90 * 0.9 = 81)

If we plug in this number, we can get what is making the best response for Firm A.

1. PA = 90 (Cut price by 10%)

Then 3.5 – 1.3 * log(90) + 1.5 * log(81) = 3.8222

2. PA = 100 (No price change)

Then 3.5 – 1.3 * log(100) + 1.5 * log(81) = 3.762

2. PA = 110 (Increase price by 10%)

Then 3.5 – 1.3 * log(110) + 1.5 * log(81) = 3.7089

Cutting the price by 10% will generate the best outcome for A.

And according to the profit matrix, we will get the following profit (πA) : 6259.

2. Demand Function for Firm B is given as the following:

$\log(QB) = 2.5 + 1.6 \cdot \log(PA) - 1.2 \cdot \log(PB)$

If the Firm A cut prices by 10%, then the PA should be 90.

If we plug in this number, we can get what is making the best response for Firm B.

1. PB = 81 (Cut price by 10%)

Then 2.5 – 1.6 * log(90) + 1.5 * log(81) = 2.2359

2. PB = 90 (No price change)

Then 2.5 – 1.6 * log(90) + 1.5 * log(90) = 2.3046

2. PB = 99 (Increase price by 10%)

Then 2.5 – 1.6 * log(90) + 1.5 * log(99) = 2.3667

Increasing the price by 10% will generate the best outcome for B.

And according to the profit matrix, we will get the following profit (πB) : 8971.

3. We can infer from the table that

* When *PA* is lower, Firm A lowers its price to compete.

* When *PB* is higher, Firm B lowers its price to attract more demand.

Therefore, the equilibrium point should be somewhere low-to-mid. I picked the middle one (both Firm A and B having no change), since they are in the similar range of profits.

4. There is only one cell that each firm is doing better than the equilibrium cell, where both have 10% increase: (7963, 8971). This is only possible when there are the anti-collusive measures and market competitiveness.