TIØ4116, Exercise 9.

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Task 1

4 models

two parts: 1: cost=10 000 000 000 2: 500 000 per car.
factory sales price = pf
mutual price across dealers. PK
demand = 300 000 - (PK /4)
dealer costs per car = 50 000 dealer operating costs 5 000 000 000

A pk=pf+50000 d=300000-(pk/4) manufacturer cost, mc=10*10$\hat{9}$ +500 000d dealer cost, dc=5*10$\hat{9}$ +50 000d total cost, tc=15*10$\hat{9}$ + 550000(300000-((pf+50000)/4))

Total cost is described by tc, where pf is the price of a car from the manufacturer.

The number of cars to sell in the value chain is found by solving the equation above in regards to p when y=0. This minimizes the cost, and maximizes the profit per car. This results in a car price of 1 259 090. And a total cost of 12500. Followed by solving dc given the now known pk. Which gives the number of cars as: dc/(necessary profit per car)=(number of cars sold with dealer). Assuming profit as 25 00 per car we get number of cars = 5.

B Given the max of the demand function we get a demand of 12500. This is the optimal number of cars to sell from the manufacturer. This results pk of 1.6*10$\hat{6}$.

C With cars sold=12500 we get the most created value in the value chain. Or rather the lowest production costs, giving the most room for profit. The minimized costs happen at pf=1 150 000, and pk=1 200 000.

D Porche could have maximized the manufacturer cost so that the profits would be higher.

Task 2

A p = price, demand = 100*10$\hat{6}$ -(50*10$\hat{3}$)p, p = ((100*10$\hat{6}$)-d)/50*10$\hat{3}$, tc = d(500 + pm + pi), profit = p - tc,

This gives the profit graph as:

Input interpretation:

plot	$\frac{100\,000\,000 - d}{50\,000} - 800\,d$	$d = -0.25$ to 2.6

Plot:

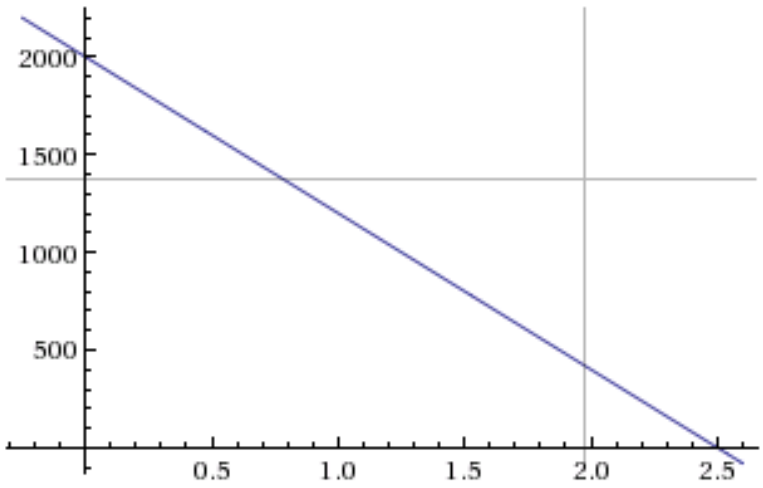

Figure 1:
Plot for task 2a.

Profit is maximized when demand goes towards 0.

B pmi will be: ((100*10$\hat{6}$)-d)/50*10$\hat{3}$ -500, which is the total price minus the price for assembly and other parts.

Input interpretation:

plot	$-500 + \frac{100\,000\,000 - d}{50\,000}$	$d = 0$ to 7.5×10^7

Plot:

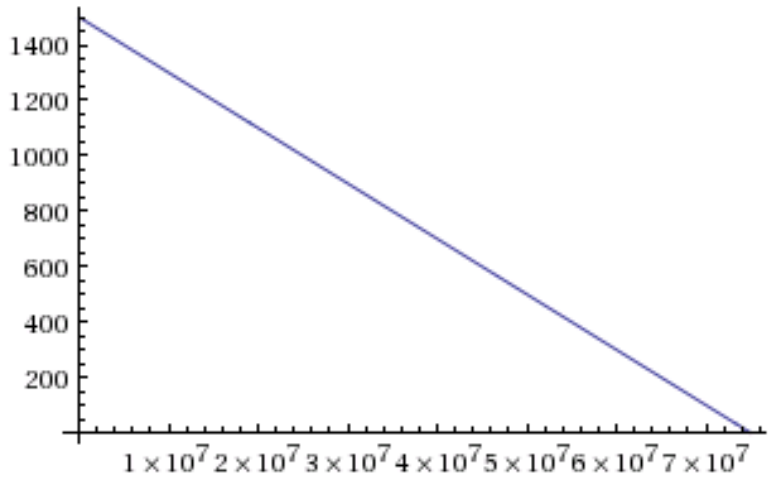

Figure 2:
Plot for task 2b.

C p = ((100*10$\hat{6}$)-d)/50*10$\hat{3}$, Intel: pi=((100*10$\hat{6}$)-d)/50*10$\hat{3}$ -500-pm, microsoft: pm=((100*10$\hat{6}$)-d)/50*10$\hat{3}$ -500-pi,

Contribution margin = price - variable cost. Intel = p - pi, microsoft = p -pm.

A nash equilibrium is when the two parts don't benefit from changing position, giving that both parties know the strategies of the other.

D It is best for the consumers to have microsoft and intel to sell their products individually. Microsoft and Intel will have a price advantage if they work in a cartel. A cartel gives benefits to all parties in the cartel, and aims to maximize profit for all parties.

It would be quite easy for intel and microsoft to work together in a cartel given subtask b.

Task 3

A Assuming that q1 = q1 we get a set of two equations with two unknowns. Solving this set we get q=24, p1=14, and p2=8.

Input interpretation:

plot	$-500 + \frac{100\,000\,000 - d}{50\,000}$	$d = 0$ to 7.5×10^7

Plot:

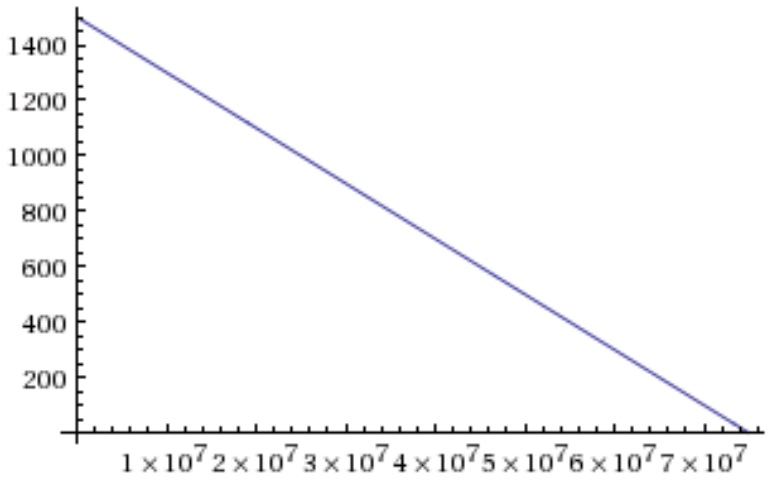

Figure 3:
Plot for task 3a.

B q1 = coca cola q2 = pepsi.

C Price elasticity:
e=(% change in demand)/(% change in price), e(coca cola)= (1/14) / (-9/24) = -0.2, e(pepsi)= (3/11) / (-13/24) = -0.5,

D e = (% Change in Quantity Demanded of Good X)/(% Change in Price of Good Y), e = (1/14) / (-13/24) = -0.13, or e = (3/11) / (-9/14) = -0.42

Input interpretation:

plot $80 - 4p$, $\frac{80 - p}{4}$ $y = -10$ to 90

Plot:

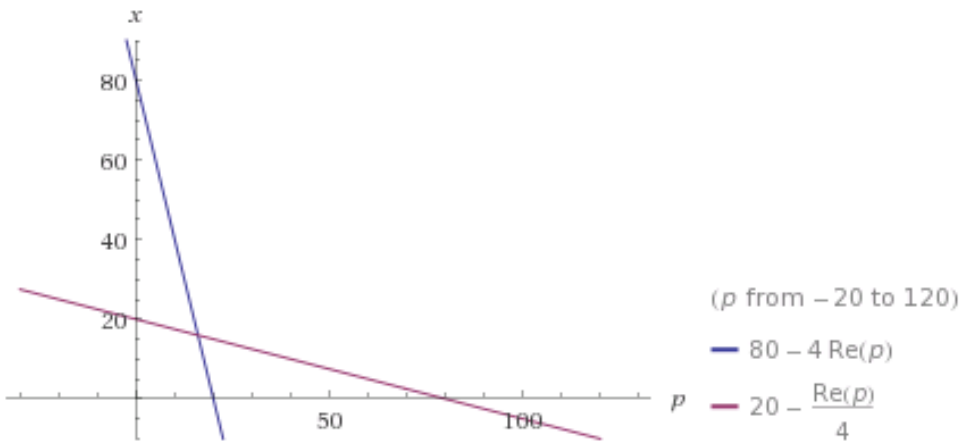

Figure 4:
task 3b, q1

E From the graph we can see that the equilibrium mostly indicates surplus in supply. If coca cola reduces costs the demand the price would go down and the demand would go up. And we would balance the equilibrium more.

Input interpretation:

plot $64 - 5\,p$, $\frac{64 - p}{5}$ $y = -10$ to 90

Plot:

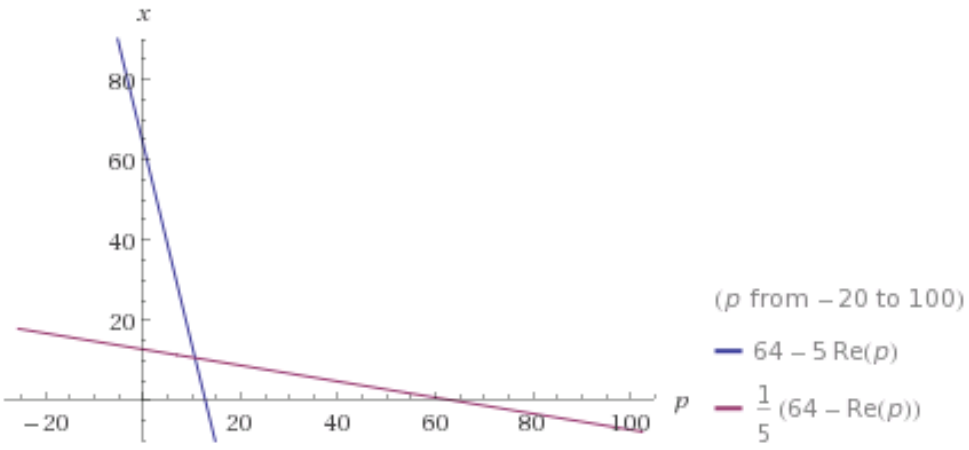

Figure 5:
task 3b, q2

Input interpretation:

plot $80 - 4\,p$, $\frac{80 - p}{4}$, $20\,(20 - p)$ $p = 0$ to 25

Plot:

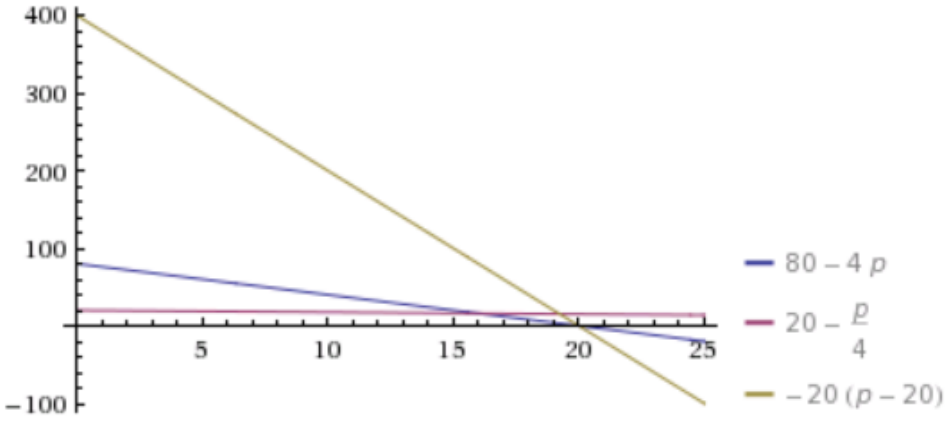

Figure 6:
task 3e