Answer on Question #55274, Economics / Finance

1. There is a fruit seller who has 30 Kgs of apples to be sold and he wants to fix a price so that all the apples are sold. There are three customers in the market and their individual demand functions are given below:

D1=25-.05P

D2=20-.025P

D3=15-.075P

Where D is the demand and P is the price.

Solution:

Market demand represents the sum of the individual demand. Thus, the market demand function for the fruit seller will be equal to:

$$\mathrm{D_m} = \mathrm{D_1} + \mathrm{D_2} + \mathrm{D_3}$$

Now, we can substitute the individual demand functions in accordance with the condition of the task:

$$\mathrm{D_m} = (25 - 0.05\mathrm{P}) + (20 - 0.025\mathrm{P}) + (15 - 0.075\mathrm{P})$$

We simplify the obtained equation:

$$\mathrm{D_m} = (25 + 20 + 15) - (0.05\mathrm{P} + 0.025\mathrm{P} + 0.075) = 60 - 0.15\mathrm{P}$$

It is known that the fruit seller wants to fix a price and to sell all apples; in this case, the total amount of apples is 30 Kgs and the price must be set so that market demand is for 30 Kgs of apples will be:

$$60 - 0.15\mathrm{P} = 30$$

Now, we need to solve the equation for the price. We add -60 to both sides of the equation:

$$-0.15\mathrm{P} = 30 - 60$$

Then, we divide both sides of the equation by -0.15:

$$-0.15\mathrm{P} = -30$$

$$\mathrm{P} = \$200$$

Thus, $200 is priced, at which fruit seller can sell all the apples. Consequently, we can determine the individual demands:

$$\mathrm{D_1} = 25 - .05\mathrm{P} = 25 - (0.05 \cdot \$200) = 25 - 10 = 15 \text{ (units)}$$

$$D_2 = 20 - 0.025P = 20 - (0.025 \cdot \$200) = 20 - 5 = 15 \text{ (units)}$$

$$D_3 = 15 - 0.075P = 15 - (0.075 \cdot \$200) = 15 - 15 = 0 \text{ (units)}$$

Thus, the demand of each of the three buyers is:

$$D_1 = 15 \text{ units}, D_2 = 15 \text{ units and } D_3 = 0 \text{ units}.$$