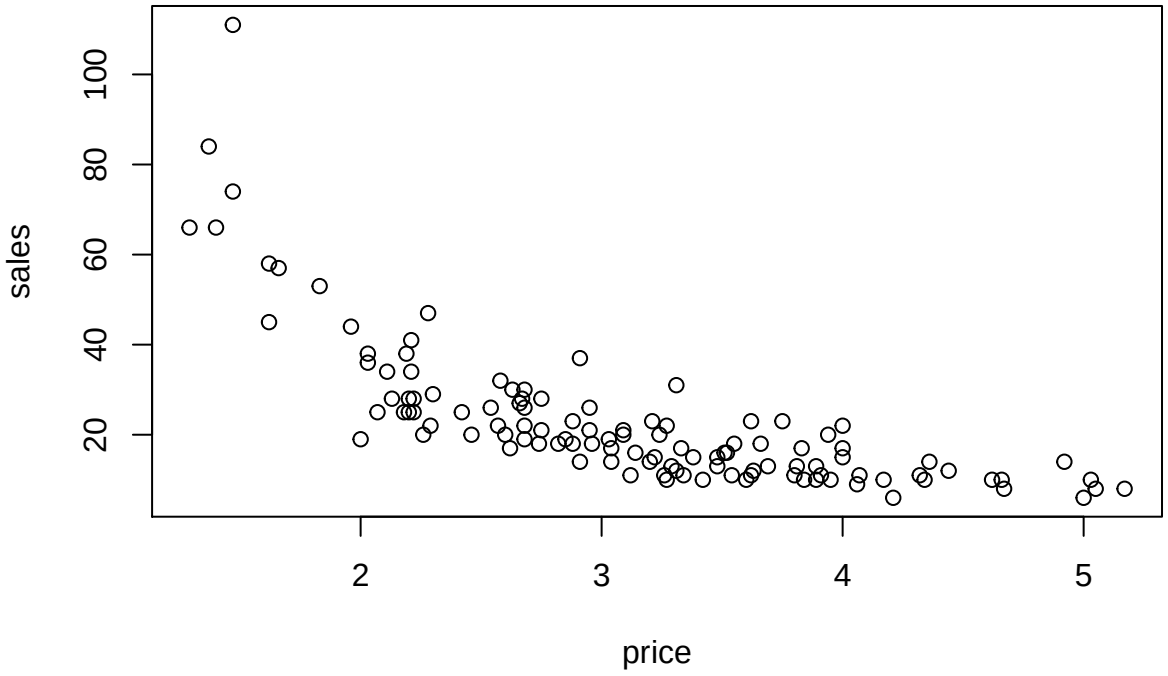
Milk Prices

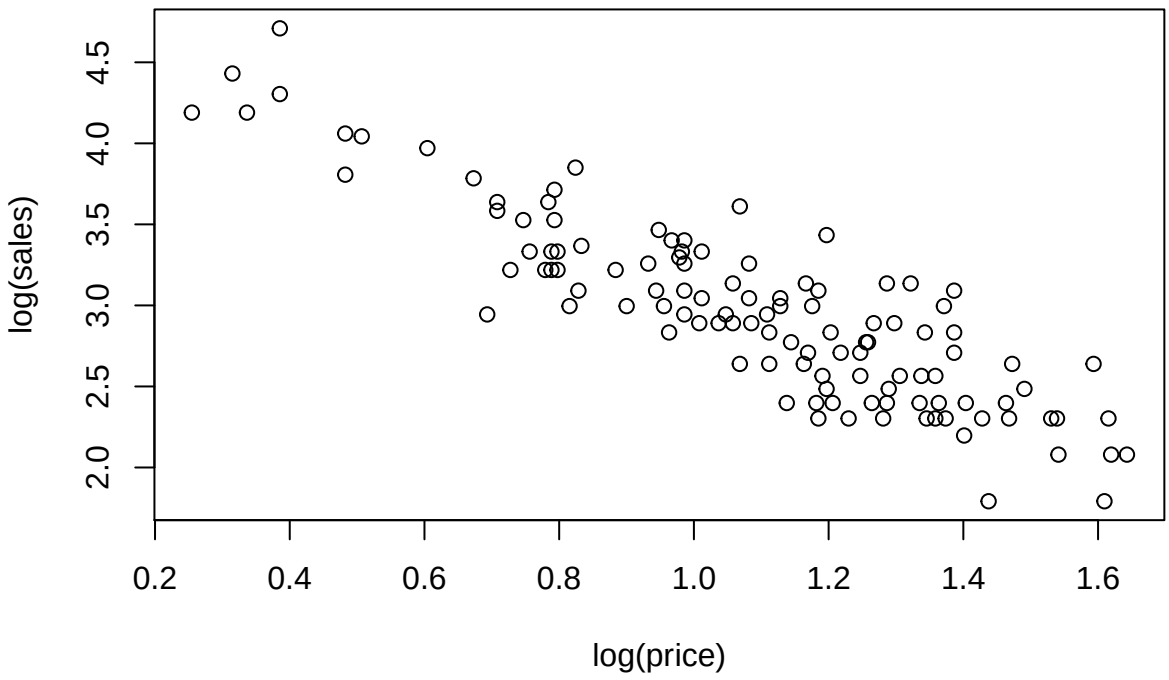
Richard Marks

2/13/2020

To answer the question of what price a store should sell its milk at we must use a decpetivly simple looking formula. n=(p-c)Q, where n is the price the milk should be sold, p is the price the milk is already sold, c is the cost of the milk for the store, and Q is the quantity of milk sold. However Q is actually a function of P, since the price of the milk effects how much milk is actually sold. So the function is actually n=(p-c)*f(p), where

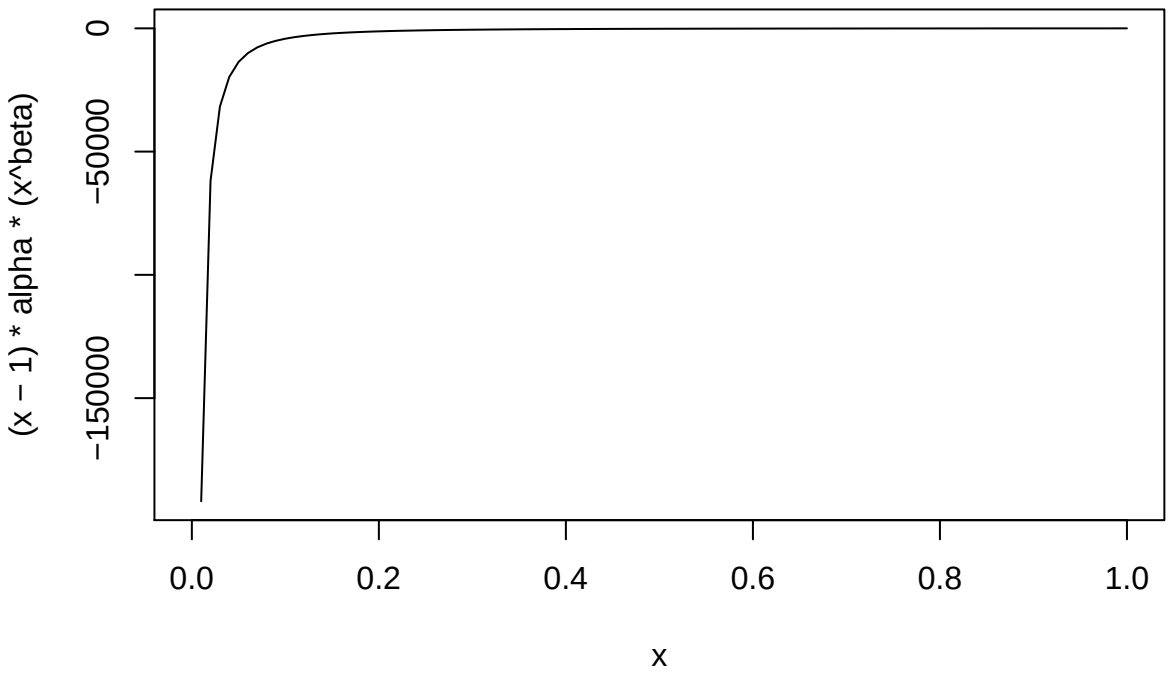


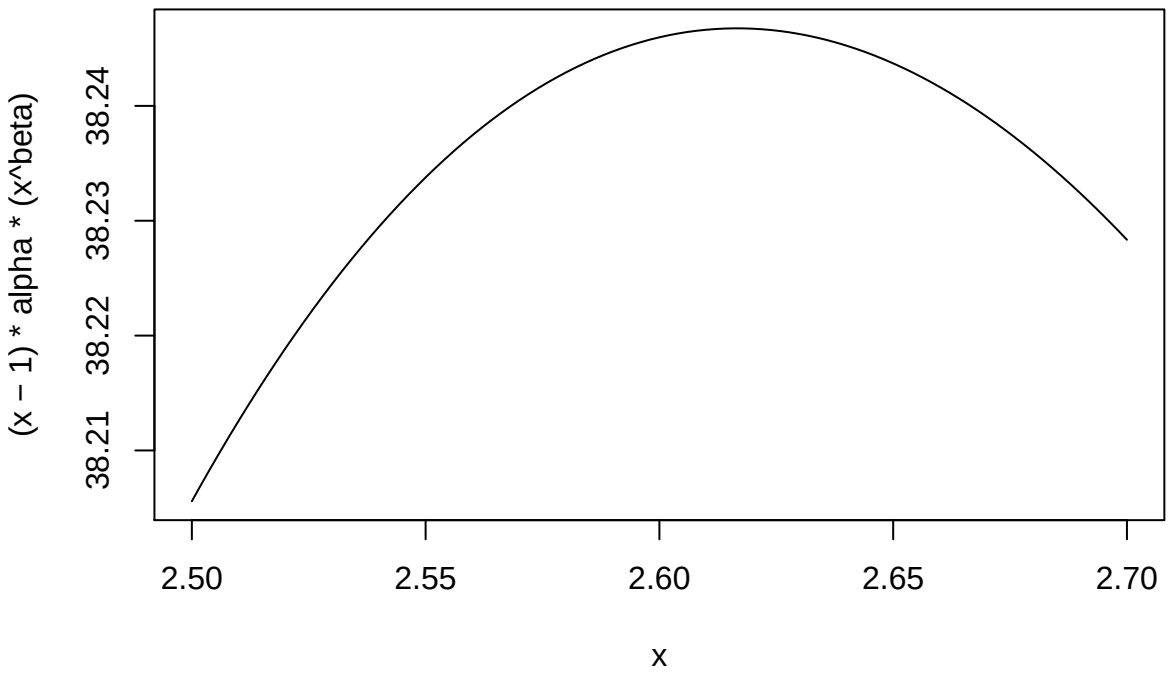
c=1




```
## (Intercept)  log(price)
##    4.720604   -1.618578
```

Now if we plot the price of the milk and the quantity sold we see that the relationship is non-linear. However if we take the logarithim of both the price and quantity and plot it on a graph we find a negative linear relationship between the two. Since we have created a linear relationship we can now use linear regression to find the slope and intercept. Since quantity is a function of price it can be expressed as Q= eˆalpha*pˆbeta where alpha= exp(intercept) and beta= slope.*


(x – 1) * alpha * (x^beta)
0
−50000
−150000
0.0
0.2
0.4
0.6
0.8
1.0
x



*Now that we know what q is we have everything we need to find the optimal price of milk. if we plug in q the equation is n=(p-1)*alpha*pˆbeta. If we plot this equation onto a graph we can see that there is a peak maximum between $2.60 and $2.65. Therefore that is the optimal price range for milk.