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Section 4.6 – In class examples

Math 151 – Spring 2018

1. The demand for yams is given by $q = 5000 - 10p^2$, where q is in pounds of yams and p is the price of a pound of yams.

(a) If the current price of yams is \$2 per pound, how many pounds will be sold?

The quantity sold is $q = 5000 - 10(2)^2 = 4960$.

(b) Is the demand at \$2 elastic or inelastic? Is it more accurate to say “People want yams and will buy them no matter what the price” or “Yams are a luxury item and people will stop buying them if the price gets too high”?

Elasticity = $\left| \frac{p}{q} \cdot \frac{dq}{dp} \right|$ substituting $p = 2$ and $q = 4960$ and using computing the derivative of the demand function as $f'(p) = -20p$ we get $E = \frac{80}{4960}$. Since $E < 1$ the demand is inelastic, so it would be more accurate to say “People want yams and will buy them no matter what the price”.

(c) At a price of \$2 per pound, what is the total revenue for the yam farmer?

Revenue = $2 \cdot 4960 = \$9,920$

(d) Write the revenue as a function of price, and then find the price that maximizes the revenue $R(p) = p(5000 - 10p^2) = 5000p - 10p^3$. To maximize revenue we take the derivative and set it equal to 0. $R'(p) = 5000 - 30p^2$, solving yields $p = 12.91$ Check that this is a max using the second derivative.

(e) What is the quantity sold at the price found in (d). Calculate the elasticity The quantity sold is 3333.32. Your Elasticity should be 1.