This note is intended to clarify the relationship between elasticity of demand and revenue.

The fact that I presented in class was:

1. **If** $0 < E(p) < 1$**, then** $\frac{dR}{dp} > 0$ **(the change in revenue is in the same direction as a (small) change in price).**
2. **If** $E(p) > 1$**, then** $\frac{dR}{dp} < 0$ **(the change in revenue is in the opposite direction as a (small) change in price).**

In this note, I will compute some examples to illustrate these two cases.

The examples also illustrate the general idea as to why the fact is true, and can be generalized to give a proof of the fact.

Example 1. $0 < E(p) < 1$:

Suppose that $E(p) = \frac{1}{3}$. (Remember that $E(p) = -\frac{\%\Delta \text{ in } q}{\%\Delta \text{ in } p}$).

This means that if the price is raised by 3%, the quantity demanded will fall by 1%.

Let's look at the effect this has on revenue.

Remember that *revenue* = price * quantity demanded = $p * q$.

If price rises by 3%, then the new price is $1.03p$ (103% of the old price).

If the quantity demanded falls by 1%, then the new quantity demanded is $0.99q$ (99% of the old quantity).

So, this means that the new revenue is new price * new quantity demanded = $1.03p * .99q = 1.0197 * pq$. Therefore, the revenue has increased.

Example 2. $E(p) > 1$:

Suppose that $E(p) = 3$. (Remember that $E(p) = -\frac{\%\Delta \text{ in } q}{\%\Delta \text{ in } p}$).

This means that if the price is raised by 1%, the quantity demanded will fall by 3%.

Let's look at the effect this has on revenue.

Remember that *revenue* = price * quantity demanded = $p * q$.

If price rises by 1%, then the new price is $1.01p$ (101% of the old price).

If the quantity demanded falls by 3%, then the new quantity demanded is $0.97q$ (97% of the old quantity).

So, this means that the new revenue is new price * new quantity demanded $= 1.01p * .97q = 0.9797 * pq$. Therefore, the revenue has decreased.