

Elasticities and Costs: Problems

Consider the demand for cats:

Cats	Marginal Utility	Marginal Cost
1	\$100	\$1
2	\$70	\$3
3	\$50	\$7
4	\$30	\$12
5	\$20	\$20
6	\$10	\$30
7	\$1	\$100
8	-\$20	\$1000
9	-\$6800	\$1,000,000
10	-\$1,000,000	\$1,000,000,000

1. (Review). This occurs where marginal cost (demand) equals marginal utility (demand). Here, that is where the quantity equals five and the price equals \$20.
2. (Review). This is a reduction in demand. The price falls and quantity decreases.
3. (Bonus) Meow.
4. Here, it occurs when quantity equals seven. Any additional cats reduce utility- marginal utility becomes negative for the eighth cat. Perhaps households obtain disutility from being known as a crazy cat person. Never be a crazy cat person.
5. The quantity of cats falls from 6 to 5, a 16.7% reduction? This is in response to a 100% increase in price; $e^d = \frac{-0.167}{1} = -0.167$, Cats are an inelastic good.

This is a 40% price increase. The quantity of cats demand falls from 3 to 2 (33.3%). So $e^d = \frac{-0.333}{0.4} = -0.83$ At this point in the demand curve, cats are more elastic (though still not an especially elastic good).

7. The income elasticity of demand is $\frac{-0.5}{0} = -10$.
8. Cats are a highly inferior good. Higher income levels decrease the demand for cats.
9. Because they are compliments, this will reduce the demand for cats. This reduces the equilibrium price and quantity..

The price increase is 67% and the quantity increase is 100%. $e^s = \frac{1}{.067} = 1.5$

11.

Table 2: Market for Cats

Cats	Marginal Utility	Marginal Cost	Total Cost	Ave. Cost
1	\$100	\$1	51	51
2	\$70	\$3	54	27
3	\$50	\$7	61	20.3
4	\$30	\$12	73	18.3
5	\$20	\$20	93	18.6
6	\$10	\$30	123	20.5
7	\$1	\$100	223	31.8
8	-\$20	\$1000	1223	152.9
9	-\$6800	\$1,000,000	1,001,223	111,247
10	-\$1,000,000	\$1,000,000,000	1,001,001,223	100,100,122

Here, average total cost is minimized when quantity equals four.

12. We often think of labor as flexible in the short-run meaning that firms can quickly adjust the size of their workforce. We tend to think of capital as fixed in the short-run. Both of these are approximations and there are many counterexamples. Land and technology tend to be fixed in the short-run. Energy use tends to be more flexible.

13. In the long-run, firms have more flexibility to adjust all of the inputs of production. They can thus adjust both capital and labor to find the cheapest way to produce output rather than only being able to adjust labor.

14. Profits are revenue minus costs.

15. It gets lost in the Bermuda Triangle.

16. If the good is highly inelastic, the tax will be mostly passed on to a higher price and there will be a much smaller change in quantity. The tax will be more effective at reducing quantity if the good is elastic.

17. This is a demand curve that starts off being flat, but then becomes steeper for higher quantities. A good that has stable marginal utility for low quantities but where the marginal

utility rapidly falls after some point would be an example. One (there are many) example might be a highly perishable food.

18. False, Luxury goods are a type of normal good because the demand for them is increasing income. Luxury goods are sometimes defined by having an income elasticity greater than one, meaning that a 1% increase in income leads to more than a 1% increase in the quantity demanded. This is stronger than the definition of a normal goods that simply says the effect of increasing income is more demand.