

Supply and Demand: Key

1. A key assumption in our model of supply and demand is that there are many buyers and sellers so that neither group is able to exhibit market power. This assumption fits the market for insulin well. For nuclear missiles, however, there are very few buyers. So a buyer, like the U.S. government is likely to be able to restrict quantity in order to attain a lower, more favorable price.
2. Demand is marginal utility. So the demand curve is flat and always equal to this constant marginal utility.
3. As in class, this implies an upward sloping supply curve.
4. This reduces marginal cost so that firms produce more output at any price. Graphically, supply shifts to the right. Quantity increases. But because demand is flat, the price is unchanged. Were demand downward sloping, the price would have decreased.
5. When the amount of a complement increases, demand increases. When demand shifts up, quantity and price both increase.
6. In this case, the demand curve is vertical. When supply increases (from #4), price decreases but there is no change in quantity.

For #7-8, we calculate marginal cost and marginal supply:

Table 1: Market for Insulin

Units	Total Utility	Total Cost	Marginal Utility	Marginal Cost
1	\$1000	\$100	\$1000	\$100
2	\$1950	\$150	\$950	\$50
3	\$2850	\$250	\$900	\$100
4	\$3700	\$400	\$850	\$150
5	\$4400	\$600	\$700	\$200
6	\$5100	\$850	\$700	\$250
7	\$5700	\$1150	\$600	\$300
8	\$6300	\$1500	\$600	\$350
9	\$6800	\$1900	\$500	\$400
10	\$7300	\$2400	\$500	\$500

7. Demand is marginal utility because a rational, utility maximizing household will purchase the good as long as marginal utility is greater than the price. We are assuming that insulin displays

decreasing marginal utility which then causes the demand curve to be downward sloping. This is true for most, but not all, goods and services.

8. Supply is marginal cost because a rational, profit maximizing firm will produce the good as long as the price is greater than marginal cost. Notice that marginal cost is *mostly* increasing. There is a small, downward sloping part for low levels of output. I am sneaky like that.

9. Price equals \$500 and quantity equals 10.

10.

Table 2: Market for Insulin

Units	Total Utility	Total Cost	Marginal Utility	Marginal Cost
1	\$1000	\$200	\$1000	\$200
2	\$1950	\$300	\$950	\$100
3	\$2850	\$500	\$900	\$200
4	\$3700	\$800	\$850	\$350
5	\$4400	\$1200	\$700	\$400
6	\$5100	\$1700	\$700	\$500
7	\$5700	\$2300	\$600	\$600
8	\$6300	\$3000	\$600	\$700
9	\$6800	\$3800	\$500	\$800
10	\$7300	\$4800	\$500	\$1000

Now price equals \$600 and quantity equals 7.

11. This question is a little out of place as we have not yet introduced the concept of firms passing costs on. But here we go...

Before the change in costs, it cost the firm \$850 to produce the first 6 units. Because each unit cost \$500, households spent \$3000 on these six units.

Now with higher costs, these 6 units cost double, \$1700. Costs have risen by \$850. The price is now \$600 so households pay \$3600 in total, an increase in \$600.

So firms have \$850 in added costs and households pay \$600 more. We might say that households pay for $\frac{600}{850} = 71\%$ of the added costs, This is the amount that is passed on to households.

Later, we will see that the slope of the demand curve affects how cost increases are passed on. If it is vertical, 100% of cost increases are passed on. If it is flat, cost increases are not passed on at all.

12. The goal of this question is to get students to think about sources of utility apart from the consumption of goods and services. Some examples include leisure time, the utility of others (altruism), the disutility of others (spite), health, etc.

13. There is no single correct answer. Most goods exhibit decreasing marginal utility but there are counterexamples. One common example is a good that is part of a set where the set must be complete to fully serve its function. The fourth tire on a car, for example, provides more marginal utility than the third.