

1. Choose the correct answers in the table below to test your understanding of the “total revenue test”

Price elasticity of demand and total revenue

	% change in P	%change in Qd	Over this price range, demand is:	As a result of the DP, TR will
(A)	+5%	-2%	elastic/ unit elastic/ inelastic	rise / fall/ not change
(B)	+5%	-5%	elastic/ unit elastic / inelastic	rise/ fall/ not change
(C)	+5%	-8%	elastic / unit elastic/ inelastic	rise/ fall / not change
(D)	-4%	+6%	elastic / unit elastic/ inelastic	rise / fall/ not change
(E)	-4%	+3%	elastic/ unit elastic/ inelastic	rise/ fall / not change
(F)	-4%	+4%	elastic/ unit elastic / inelastic	rise/ fall/ not change

2. Complete the table below by determining the value of TR before and after the price change, then answer the questions below.

	P	Qd	TR
(A) Old value	\$15	10 million	\$ 150 million
(B) New value	\$17	6 million	\$ 102 million

(C) How did TR change when P increased?

TR decreased when P increased over this price range

(D) This indicates that demand over this price range is **(elastic)**/unit elastic/inelastic).

Cross Elasticity

Goods that are consumed together are complementary goods. Chicken and beef are substitutes. When the price of peanut butter goes up, people buy less peanut butter and less jelly. The demand for jelly decreases. A good is a complementary good when the cross elasticity of demand is negative. A good is a sub when the cross elasticity is positive. Sally always has cream in her coffee. When the price of coffee increased 10%, Sally decreased her consumption of cream by 5%. Coffee and cream are complements for Sally. Juan is a socialite. For Juan espresso is a substitute latte. When the price of espresso increases 8%, Juan's demand for latte increases 10%.

The general formula is given below. If the result of the change in demand for good A divided by the change in the price for good B is positive, the goods are subs. Otherwise, comp's.

$$\frac{\% \Delta QD_A}{\% \Delta \$ P_B} = X_{ED}$$

Complete the table using the Xed formula above.

Good A	Good B	Xed	Substitute or Complement
Shoes	Socks		
Qd -8%	\$P+6%	-8/6	Compliment
Pens	Pencils		
Qd +10%	\$P +12%	10/12	Substitute
Corn	Soybeans		
Qd +12%	\$P +16%	12/16	Substitute
Books	Kindle		

Qd +3%	\$P +9%	3/9	Substitute
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Income Elasticity

When your income goes up, do you buy more or less of a good, say, hotdogs? If you buy more, the good is a normal good. If you buy less, the good is an inferior good. Juan's boss just gave him a \$1 an hour raise. As a result of this wage increase, Juan's income goes up. Juan buys more downloads from the iTunes store. For Juan, downloads are a normal good. If, for example, Juan's income increased 10% and his downloads increased 3%, Juan's income elasticity is $+3 = 3\%/10\%$. Since the result of this ratio is positive. Downloads are a normal good. If the good is inferior, then quantity demanded, Qd, will be negative. A negative income elasticity indicates that the good is inferior. A positive income elasticity indicates that the good is normal.

$$\frac{\% \Delta Q_d}{\% \Delta Y} = \text{Income Elasticity}$$

Income	Qd	Yed	Normal or Inferior
+ Y 3%	-10% Head Cheese	-3.3	Inferior
+Y 6%	+5% Breakfast Bars	.83	Normal
-Y 20%	+12% Macaroni	-.6	Inferior
+Y 50%	+64% Diamonds	1.28	Normal
-Y 35%	+40% Ramen Noodles	-1.14	Inferior

1. Anna owns the Sweet Alps Chocolate store. She charges \$10 per pound for her hand made chocolate. You, the economist, have calculated the elasticity of demand for chocolate in her town to be 2.5. If she wants to increase her total revenue, what advice will you give her and why? Be able to explain your answer.

1. Anna should lower her price. Her price elasticity of demand for chocolate is elastic (greater than one) and therefore, when she lowers her price she will sell a lot more chocolate. The greater quantity sold will make up for her lower price, increasing her total revenue. In other words, she is selling at a lower price but making up for it in volume of sales.

2. If the cross elasticity of demand between peanut butter and milk is -1.11, then are peanut butter and milk substitutes or complements? Be able to explain your answer.

2. Peanut butter and milk are complements because a negative cross price elasticity of demand means that as the price of milk goes up, the demand for peanut butter goes down. This would indicate that when the price of milk goes up, we buy less milk and we are also buying less peanut butter (so we must buy these together -- they are complements).

3. A 10 percent increase in income brings about a 15 percent decrease in the demand for a good. What is the income elasticity of demand and is the good a normal good or an inferior good? Be able to explain your answer.

3. $-15\%/10\% = -.15/.10 = -1.5$. Remember the elasticity is always read as the absolute value or a positive number, so it is 1.5 (elastic, or greater than one). The good is an inferior good because the sign is negative, indicating that an increase in income will bring a decrease in the demand for the good.

4. If the price of a good increases by 8% and the quantity demanded decreases by 12%, what is the price elasticity of demand? Is it elastic, inelastic or unitary elastic?

4. $-12\%/8\% = -.12/.08 = -1.5$. Again, drop the negative sign, so the elasticity is 1.5. This means it is elastic (greater than one).

5. Discount stores sell relatively elastic goods. *Ceteris paribus*, explain why selling at a relatively low price is profitable for them?

5. It is profitable because with elastic goods, dropping the price lower can bring them a lot more business. Therefore, at the low prices they can sell a large volume of goods, making up for the lower prices and bringing in more revenue ($P \times Q$).