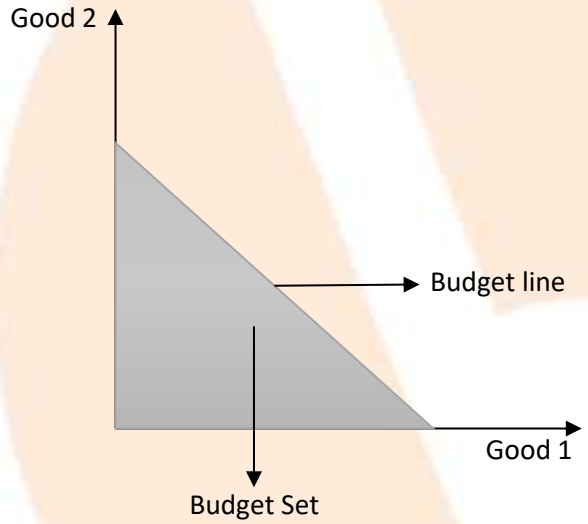
NCERT Solutions for Class 12

Micro Economics

Chapter 2 - Theory of Consumer Behaviour

1. What do you mean by the budget of a consumer?

Ans: A consumer's budget is the actual purchasing power with which he or she can buy a set of two commodities, given their prices.



The quantity of Good 1 is measured horizontally, whereas the quantity of Good 2 is measured vertically. Any point that is above or below the straight line, i.e., the budget line, make up the budget set.

2. What is budget line?

Ans: The budget line depicts all of the bundles that cost the same as the consumer's income. The budget line shows two alternative sets of products that a person can purchase dependent on his or her income and commodities costs.

Let x_1 be the amount of Good 1.

x_2 is the amount of Good 2.

While,

p_1 be the price of Good 1, and

p_2 be the price of Good 2.

p_1x_1 = Total money spent on Good 1.

p_2x_2 = Total money spent on Good 2.

Then, the budget line will be:

$p_1x_1 + p_2x_2 = M$

The consumer pays exactly the same amount for all of the consumption bundles on the budget line.

3. Explain why the budget line is downward sloping?

Ans: The budget line is sloped downward because a consumer may only increase consumption of product 1 by decreasing consumption of Good 2. The consumer has a restricted budget to spend on Goods 1 and 2.

The budget line's slope is, which denotes the rate of exchange or the rate at $\frac{-P_1}{P_2} = \frac{\Delta x_2}{\Delta x_1}$ at which Good 2 can be swapped for Good 1.

4. A consumer wants to consume two goods. The prices of the two goods are Rs 4 and Rs 5 respectively. The consumer's income is Rs 20.

(i) Write down the equation of the budget line.

Ans: Let x_1 denote Good 1 and

x_2 denotes Good 2.

$P_1 = \text{Rs } 4, P_2 = \text{Rs } 5, M = \text{Rs } 20$

$P_1x_1 + P_2x_2 = M$

$4x_1 + 5x_2 = 20$

Thus, the equation of the budget line is $4x_1 + 5x_2 = 20$.

(ii) How much of good 1 can the consumer consume if she spends her entire income on that good?

Ans: If Rs 20 is spent totally on good 1, the amount needed for Good 2 would be zero, i.e. $x_2 = 0$, because the consumer has no money left to spend on Good 2.

$$4x_1 + 5(0) = 204x_1 = 20x_1 = \frac{20}{4}x_1 = 5$$

So, the amount of Good 1 consumed is 5 units.

(iii) How much of good 2 can she consume if she spends her entire income on that good?

Ans: If the consumer spends all of his or her money on Good 2, the result is $x_1 = 0$, because the consumer has no money left to spend on Good 1.

$$4(0) + 5x_2 = 205x_2 = 20x_2 = \frac{20}{5}x_2 = 4$$

The amount of Good 2 consumed is 4 units.

(iv) What is the slope of the budget line?

Ans: Slope of the budget line = $\frac{-P_1}{P_2}$

$$= \frac{-\text{Price of Good 1}}{\text{Price of Good 2}} = -\frac{4}{5}$$
$$= -0.8$$

Questions 5, 6 and 7 are related to question 4.

5. How does the budget line change if the consumer's income increases to Rs 40 but the prices remain unchanged?

Ans: $M_2 = \text{Rs. } 40$

$P_1 = \text{Rs. } 4$

$P_2 = \text{Rs. } 5$

Initial equation of the budget line:

$4x_1 + 5x_2 = 20$

New equation of the budget line:

$4x_1 + 5x_2 = 40$

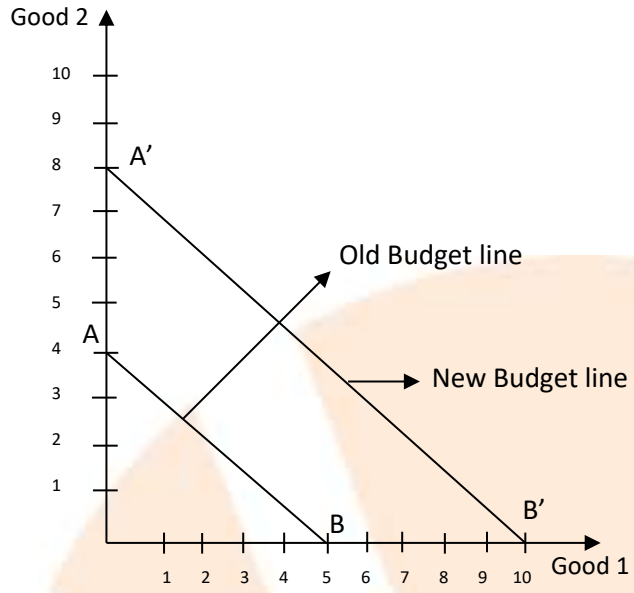
The consumer may now buy more of both commodities and services as M increases, and the rise in income results in a corresponding outward shift of the budget line from AB to A'B'.

Horizontal intercept will be $= \frac{M}{P_1} = \frac{40}{4} = 10$

Vertical intercept will be $= \frac{M}{P_2} = \frac{40}{5} = 8$

The new budget line's slope will be similar to the real budget line.

$\frac{-P_1}{P_2} = \frac{4}{5}$



6. How does the budget line change if the price of good 2 decreases by a rupee but the price of good 1 and the consumer's income remain unchanged?

Ans: $P_1 = \text{Rs. } 4$

$P_2 = \text{Rs. } 5$

$P_2^1 = \text{Rs. } 4$

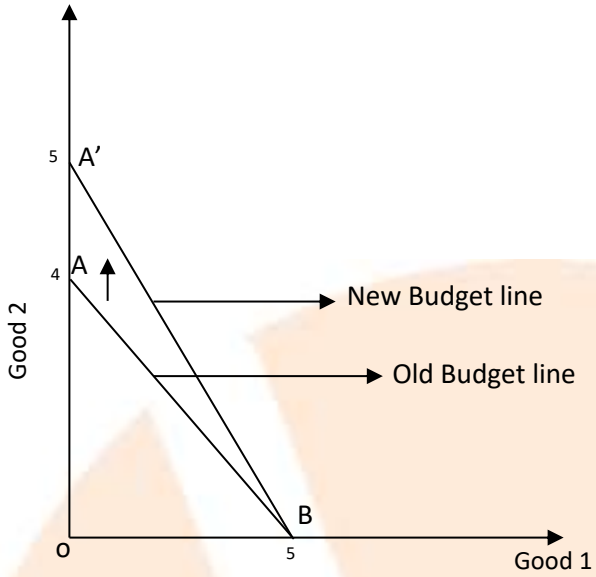
M = Rs. 20

The drop in the price of Good 2 will raise the vertical intercept of the budget line because the income and price of Good 1 stay unchanged. The new budget line will pivot outwards as well, centred on the same horizontal intercept.

Horizontal intercept will be $= \frac{M}{P_1} = \frac{20}{4} = 5$

Vertical intercept will be $= \frac{M}{P_2} = \frac{20}{4} = 5$

$\text{Slope} = \frac{-P_1}{P_2} = \frac{4}{4} = 1$



The slope of the new budget line will be higher, and it will be steeper than the previous one.

7. What happens to the budget set if both the prices as well as the income double?

Ans: The budget line will not change if the prices and income are both doubled.

$M_1 = \text{Rs } 20, M_2 = \text{Rs } 40 P_1 = \text{Rs } 4, P_1 = \text{Rs } 8 P_2 = \text{Rs } 5, P_2 = \text{Rs } 10$

Horizontal intercept will be $= \frac{M_1}{P_1} = \frac{40}{8} = 5$

Vertical intercept will be $= \frac{M_2}{P_2} = \frac{40}{10} = 4$

Slope $= \frac{-P_1}{P_2} = \frac{-8}{10} = -0.8$

As a result, the budget line's vertical intercept, horizontal intercept, and slope will remain unchanged. The new budget line will be identical to the existing budget line, but it will be linked to higher income and higher pricing for both commodities.

8. Suppose a consumer can afford to buy 6 units of good 1 and 8 units of good 2 if she spends her entire income. The prices of the two goods are Rs 6 and Rs 8 respectively. How much is the consumer's income?

Ans:

$P_1 = \text{Rs } 6 P_2 = \text{Rs } 8 x_1 = 6 x_2 = 8$

Budget line $= M = P_1 x_1 + P_2 x_2$

M = 6 x 6 + 8 x 8

M = 36 + 64

M = 100

Thus, the consumer's income is Rs 100.

9. Suppose a consumer wants to consume two goods which are available only in integer units. The two goods are equally priced at Rs 10 and the consumer's income is Rs 40.

(i) Write down all the bundles that are available to the consumer.

Ans: $P_1 = \text{Rs } 10$

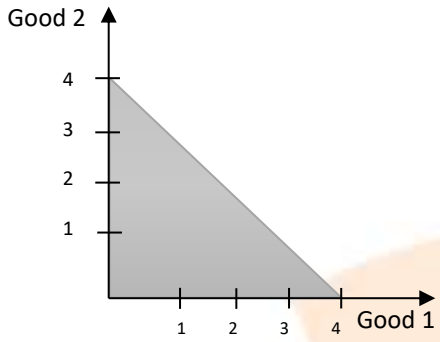
$P_2 = \text{Rs } 10$

M = Rs 40

Budget set $= P_1 x_1 + P_2 x_2 \leq M$

$10 x_1 + 10 x_2 \leq 40$

The consumer should be able to purchase bundles for less than or equivalent to Rs 40.



Horizontal intercept will be $= \frac{M_1}{P_1} = \frac{40}{10} = 4$

Vertical intercept will be $= \frac{M_2}{P_2} = \frac{40}{10} = 4$

Slope $= \frac{-P_1}{P_2} = \frac{-10}{10} = -1$

The consumer has access to all of the bundles in the shaded region ΔAOB, including those on the line AB.

(0, 0) (0, 1) (0, 2) (0, 3) (0, 4)

(1, 0) (1, 1) (1, 2) (1, 3) (2, 0)

(2, 1) (2, 2) (3, 0) (3, 1) (4, 0)

(ii) Among the bundles that are available to the consumer, identify those which cost her exactly Rs 40.

Ans: The cost of the coordinates on the line AB is the same as the consumer's income. The following are the bundles:

(0,4) (1,3) (2,2) (3,1) (4,0)

10. What do you mean by 'monotonic preferences'?

Ans: If and only if, a consumer's preferences are monotonic between any two bundles. The consumer prefers bundles that contain more of at least one good and no less of the other good than the other bundle. More of a commodity is always preferred by a rational customer since it provides him with a higher level of enjoyment.

Example: If a buyer has the option to choose between bundles A(4,6) and B(4,2), he or she will choose bundle A since it contains more units of Good 2 than bundle B.

11. If a consumer has monotonic preferences, can she be indifferent between the bundles (10, 8) and (8, 6)?

Ans: According to monotonic preferences, a customer cannot choose between these two bundles because bundle 1 contains more of both commodities than bundle 2. Bundle 1 is preferred above bundle 2 since it contains 10 units of Good 1 and 8 units of Good 2, whereas bundle 2 contains 8 units and 6 units of Good 1 and Good 2, respectively.

12. Suppose a consumer's preferences are monotonic. What can you say about her preference ranking over the bundles (10, 10), (10, 9) and (9, 9)?

Ans: If a customer has monotone preferences, they will be ranked in the following order:

(10,10) as the first preference

(10,9) as the second preference, and

(9,9) as the third preference.

13. Suppose your friend is indifferent to the bundles (5, 6) and (6, 6). Are the preferences of your friend monotonic?

Ans: Given that my friend has differing viewpoints on the bundles (5,6), (6,6). This indicates that his or her tastes are not consistent. If he or she is unconcerned about both bundles, it signifies that they provide the same level of satisfaction

and are ranked similarly. On the other hand, the second bundle has more of both goods. As a result, he/she must favour the second bundle above the first, based on the monotonic assumption.

14. Suppose there are two consumers in the market for a good and their demand functions are as follows:

$d_1(p) = 20 – p$ for any price less than or equal to 20, and $d_1(p) = 0$ at any price greater than 20.

$d_2(p) = 30 – 2p$ for any price less than or equal to 15 and $d_1(p) = 0$ at any price greater than 15.

Find out the market demand function.

Ans: $d_1(p) = 20 - p \{ p \le 20 \; p > 20$

$d_2(p) = 30 - 2p \{ p \le 15 \; p > 15$

For the price less than Rs. 15 $(p \le 15)$

Market demand for a good $= d_1(p) + d_2(p)$

$= 20 - p + 30 - 2p$

$= 50 - 3p$

For price more than Rs. 15 but less than Rs 20 $(15 < p \le 20)$

Market demand $= d_1(p) + d_2(p)$

$= 20 - p + 0 \left(\because \text{for } p > 15, d_2(p) = 0 \right)$

$= 20 - p$

For price more than 20 $(p > 20)$

Market demand $= d_1(p) + d_2(p)$

$= 0 + 0 \left(\because \text{for } p > 10, d_1(p) = 0, d_2(p) = 0 \right)$

$= 0$

Thus, the market demand

$= 50 - 3p, \text{ if } p \le 15 = 20 - p, \text{ if } 15 < p \le 20 = 0 \text{ if } p > 20$

15. Suppose there are 20 consumers for a good and they have identical demand functions:

$d(p) = 10 - 3p$ for any price less than or equal to $\frac{10}{3}$ and $d_1(p) = 0$ at any price greater than $\frac{10}{3}$.

Ans: $d(p) = 10 - 3p, \text{ if } p \le \frac{10}{3}$

$d_1(p) = 0 \text{ if } p > \frac{10}{3}$

Market demand is the total of all of the market's customers' demands.

For price $\le \frac{10}{3}$

Market demand $= 20 \sum d(p) [\text{Sinceconsumershavesimilardemandcurve}]$

$= 20 \times (10 - 3p)$

$= 200 - 6p$

For price $> \frac{10}{3}$

Market demand = $20 \times d_1(p)$

= 20 x 0

= 0

Market demand function = $200 - 6p \begin{cases} \text{if } p \le \frac{10}{3} \\ \text{if } p > \frac{10}{3} \end{cases}$

= 0

16. Consider a market where there are just two consumers and suppose their demands for the good are given as follows:

Calculate the market demand for the good.

p	**d_1**	**d_2**
1	**9**	**24**
2	**8**	**20**
3	**7**	**18**
4	**6**	**16**
5	**5**	**14**
6	**4**	**12**

Ans:

p	d_1	d_2	Market Demand (D) = (d_1 + d_2)	Total
1	9	24	9 + 24	33
2	8	20	8 + 20	28
3	7	18	7 + 18	25
4	6	16	6 + 16	22

5	5	14	5 + 14	19
6	4	12	4 + 12	16

17. What do you mean by a normal good?

Ans: The demand for a normal good grows in proportion to an increase in the consumer's income or wage.

18. What do you mean by an 'inferior good'? Give some examples.

Ans: When a consumer's income rises, demand for inferior goods decreases. As a result, the demand for lower-quality goods rises in tandem with consumer affordability.

Example: When the price of a good (P_x) rises, so does the demand for the good (D_x). The desire for inferior goods falls as the consumer's income rises. Foods such as coarse grains are an example.

19. What do you mean by substitutes? Give examples of two goods which are substitutes of each other.

Ans: Substitute goods are products that can be used in place of other products.

Tea and coffee, for example, are items that can be swapped for one another. If the price of tea rises, demand for tea will fall, and consumers would replace coffee for tea, resulting in an increase in coffee demand.

If there is an increase in the price of tea (P_T), then the demand for tea decreases (D_T) and the demand for coffee increases (D_C).

20. What do you mean by complements? Give examples of two goods which are complements of each other.

Ans: Complementary goods are those that are consumed together.

Tea and sugar, for example. If the price of sugar rises, the demand for tea will decline. The demand for sugar will be reduced if the price of tea rises.

If there is an increase in the price of tea (P_T), then the demand for sugar decreases (D_S).

If there is an increase in the price of sugar (P_S), then the demand for tea decreases (D_T).

21. Explain price elasticity of demand.

Ans: The price elasticity of demand is a measurement of how a change in price influences consumer demand for a product. It's computed by dividing the change in a product's needed quantity by the change in the product's cost.

$$e_d = \frac{\text{percentage change in demand for the good}}{\text{percentage change in the price of the good}}$$

$$e_d = \frac{\triangle Q}{\triangle P} \times \frac{P}{Q}$$

Where e_d = Elasticity of demand

$\triangle Q$ = Change in quantity

$\triangle P$ = Change in price

P = Initial price

Q = Initial Quantity

22. Consider the demand for a good. At price Rs 4, the demand for the good is 25 units. Suppose the price of the good increases to Rs 5, and as a result, the demand for the good falls to 20 units. Calculate the price elasticity.

Ans: $P_1 = 4, Q_1 = 25$

$P_2 = 5, Q_2 = 20$

$$\triangle P = P_2 - P_1 = 5 - 4 = 1 \triangle Q = Q_2 - Q_1 = 20 - 25 = -5 e_d = \frac{\triangle Q}{\triangle P} \times \frac{P}{Q} = \frac{-5}{1} \times \frac{4}{25} = \frac{-4}{5} e_d$$

$= -0.8$

23. Consider the demand curve D (p) = 10 – 3p. What is the elasticity at price $\frac{5}{3}$?

Ans: D (p) = 10 – 3p

$$b = \frac{\triangle D}{\triangle p} = 3$$

$$p = \frac{5}{3}$$

or

$$D(p) = 10 - 3 \times \frac{5}{3} = 10 - 5 = 5$$

D = 5 units

$$e_d = \frac{\triangle Q}{\triangle P} \times \frac{P}{Q} e_d = (-)\frac{5}{3} \times \frac{1}{5} - 3 e_d = 1$$

Therefore, the elasticity of demand is 1.

24. Suppose the price elasticity of demand for a good is – 0.2. If there is a 5 % increase in the price of the good, by what percentage will the demand for the good go down?

Ans: Note that e_d = -0.2

Hence, we need not prefix e_d to -2.

Percentage change in price = 5%

$$e_d = \frac{\text{percentage change in demand for the good}}{\text{percentage change in the price of the good}}$$

$$-0.2 = \frac{\text{percentage change in demand for the good}}{5}$$

Percentage change in quantity demanded = -1%.

Thus, there is a decrease in demand.

25. Suppose the price elasticity of demand for a good is – 0.2. How will the expenditure on the good be affected if there is a 10 % increase in the price of the good?

Ans: As the price elasticity of demand, e_p, is smaller than one in elastic demand, a rise in the price of the good will result in an increase in expenditure. Because price and expenditure are positively connected in the case of inelastic demand.

26. Suppose there was a 4 % decrease in the price of a good, and as a result, the expenditure on the good increased by 2 %. What can you say about the elasticity of demand?

Ans: Decrease in the price of a good = 4%

Increase of expenditure on the good = 2%

$$\triangle E = \triangle P\left[q + (1 + e_d)\right]$$

Since the price has dropped, the amount spent on the item will rise. This means that the percent change in demand has climbed more than the percent change in pricing has decreased.

The price of the good and the amount spent on it have an inverse relationship.

Thus, the elasticity of demand = $\frac{\%\text{ change in demand}}{\%\text{ change in price}}$

The numerator is greater than the denominator. This indicates that elasticity is greater than one. As a result, a little change in price has resulted in a larger change in demand, indicating that demand is elastic.