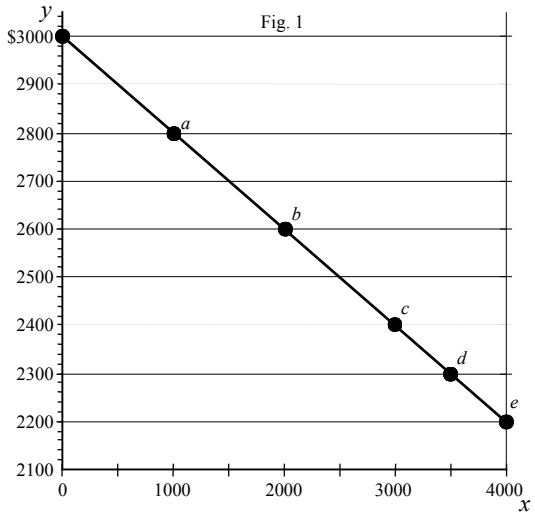
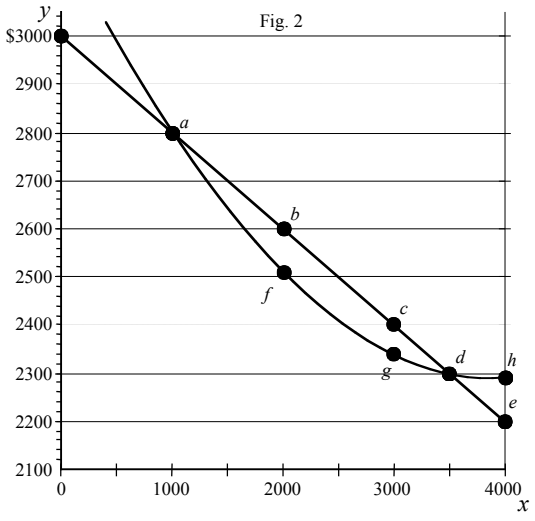
A Household's Quantity Demanded Decision

In our demand curve analysis we claimed that the quantity demanded in a market was determined, in part, by the average household's income, the characteristics of the good and the price of the good. The following is the model used in microeconomic theory to explain how an individual household weighs these elements in deciding on its quantity demanded for a particular good.

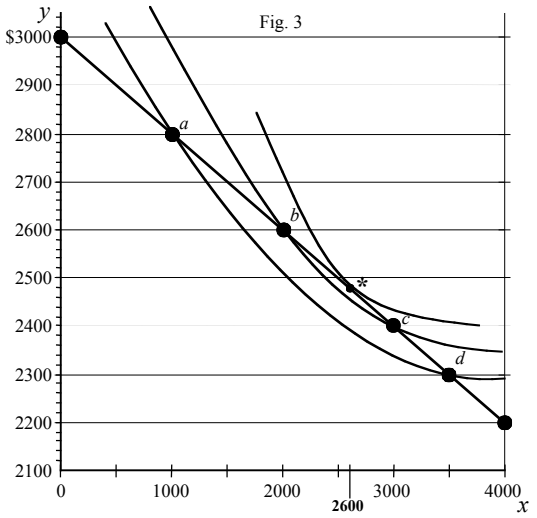
In this example we will show how a household would find the quantity of transportation demanded. Suppose a household has \$3000 of income per month (after taxes) and is currently using 1000 kilometers of transportation per month at a cost of \$.20 per km. Then it is spending \$200 on transportation and has \$2800 to spend on everything else it purchases. If we put the quantity of transportation (x) on the horizontal axis and the money available for other goods (y) on the vertical, then the household is initially at point a in Fig. 1. The points b, c, d and e are some other combinations of x and y that the household can buy with its \$3000. A *budget line* shows all possible combinations of x and y that a household can buy with its income.



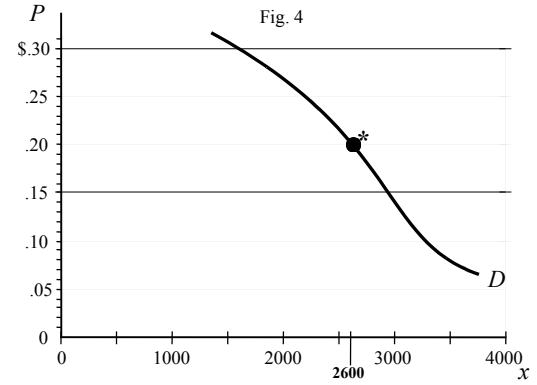
The household will buy the combination on the budget line that it likes best or, as we say in economics, the point that gives it the greatest satisfaction. Would the household choose any of points b, c, d or e over a? Notice that if it moves from a to b in Fig. 1, it will give up \$200 of y (other goods) to get an extra 1000 kms of x. Suppose that they tell us that they prefer b to a. This must mean that they would be willing to give up more than \$200 of other goods to get that extra 1000 kms of x. But how much more? Suppose that they said that they would be willing to pay up to \$290 for the extra 1000 kms, but not one penny more. If they had to pay more than \$290, then they would prefer to remain at a. Then they are just indifferent between points a and f in Fig. 2. Suppose we performed the same experiment for the movement from a to c, a to d and a to e. The points a, f, g, d and h are some combinations of x and y that the household is indifferent between and they make up an *indifference curve*. h lies above the budget line because the household is not willing to give up \$600 worth of other goods to buy the extra 3000 kms in order to move from a to e. Because the indifference curve lies below points b and c in Fig. 2 we know that the household prefers either b or c to a or d.



Suppose the household moves to point b. Is this its best choice on the budget line? We could now repeat the same type of experiment that we performed in Fig. 2, but now beginning at point b. The household would be indifferent between point b and other combinations of x and y. This would give us another indifference curve as shown in Fig. 3. Since the points between b and c lie below the budget line, we know the household prefers points between b and c to either b or c. Thus, whenever an indifference crosses the budget line at two points, the household will prefer to be between the two points.



Therefore, the household will change x until an indifference curve touches the budget line at just one point. In our example, the household will prefer point * to any other on the budget line and so the quantity demanded of transportation will be $x = 2600$ kms. It will buy $y = \$2480$ of other goods.



We can plot this quantity demanded at the price of \$.20 in another diagram as shown in Fig. 4. This will give us one point on the demand curve for transportation. To find more points on the demand curve we would construct Fig. 1 with a different price of good x but the same income (\$3000). We would go through the steps in Figs. 2 and 3 with the new price (new budget line) and find another quantity demanded to plot in Fig. 4.

We have shown above how the demand curve for transportation is determined for one household. To find the demand curve for the entire market we would perform this experiment for all households and add the results together at each price.