

2. Martha has a fixed budget of \$20, and she spends it all on two goods, X and Y. The price of X is \$4 per unit, and the price of Y is \$2 per unit. The table below shows the total benefit, measured in dollars, Martha receives from the consumption of each good.

Quantity of X	Total Benefit from X	Quantity of Y	Total Benefit from Y
0	\$0	0	\$0
1	\$16	1	\$10
2	\$28	2	\$18
3	\$36	3	\$24
4	\$40	4	\$28
5	\$41	5	\$30

- (a) What is Martha's marginal benefit of the fifth unit of good X?
- (b) Calculate the total consumer surplus if Martha consumes 5 units of X. Show your work.
- (c) Martha is currently consuming 4 units of X and 2 units of Y. Use marginal analysis to explain why this combination is not optimal for Martha.
- (d) What is Martha's optimal combination of goods X and Y?
- (e) Indicate whether each of the following will cause the optimal quantity of good Y to increase, decrease, or stay the same.
 - (i) The price of good Y doubles.
 - (ii) Martha's income falls to \$10 with no changes in prices.
 - (iii) Martha's income doubles, and the price of both goods double.