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### Producer Theory: Introductory Examples, Substitution and Income Effect

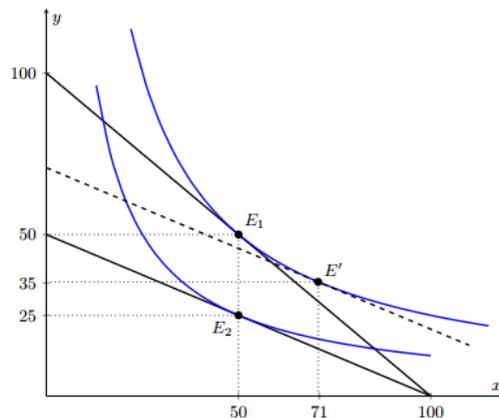
1. From the table below, it appears that this cheese curd factory is experiencing which of the following?

L, quantity of labor in person-hours	0	1	2	3	4	5	6	7	8
Q, quantity of cheese curds in pounds	0	8	18	30	44	56	66	74	80

- (a) First increasing and then diminishing returns to labor.
  - (b) Increasing returns to labor always.
  - (c) Constant returns to labor always.
  - (d) Diminishing returns to labor always.
  - (e) First diminishing and then increasing returns to labor.
2. Joey's Bakery is considering several different technologies for the production of 10,000 chocolate chip cookies that are summarized in the table below.

Technology	Capital K	Labor L
A	1	30
B	2	10
C	3	6

- (a) If the unit price of capital is \$25 and the unit price of labor is \$10, which technology should Joey's bakery use to produce these 10,000 cookies?
  - (b) If instead the unit price of capital is \$100 but the price of labor is still \$10, which technology should Joey's bakery use in producing these cookies?
3. Suppose Harry Potter has preferences over Chocolate Frogs  $x$  and boxes of Bertie Botts Every-Flavor Beans  $y$  represented in the graph below.



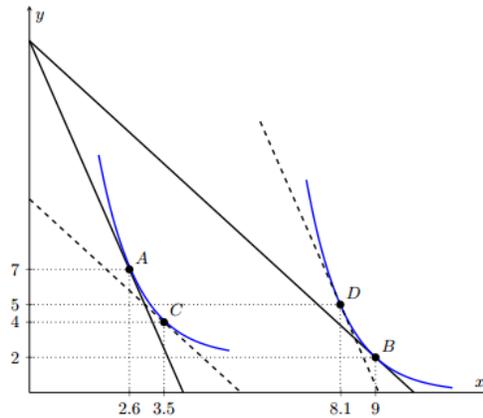
Point  $E_1$  is Harry's initial consumption bundle. Then, the price of Every-Flavor Beans increases, causing Harry to consume at point  $E_2$ . Point  $E'$  is the intermediate point "between" these two consumption bundles that is used to decompose the price (total) effect into income and substitution effects (it is therefore sometimes called a "decomposition basket").

- (a) Will the substitution effect for Chocolate Frogs be positive or negative? What about the income effect? Which effect is dominant? Explain.
- (b) Will the substitution effect for Every-Flavor Beans be positive or negative? What about the income effect? Which effect is dominant? Explain.
- (c) Compute the magnitude of these effects by completing the table below.

	Substitution Effect	Income Effect	Price (Total) Effect
Point-wise	$E_1$ to $E'$	$E'$ to $E_2$	$E_1$ to $E_2$
Chocolate Frogs			
Every-Flavor Beans			

- (d) For Harry, are Chocolate Frogs a normal or inferior good? What about Every-Flavor Beans? Justify your answer.

4. Suppose Kathleen's preferences for boots  $x$  and backpacks  $y$  are represented in the graph below. Use it to answer the following questions.



- (a) Are boots a normal or inferior good for Kathleen? What about backpacks? Explain.
- (b) Suppose Kathleen is initially consuming at point  $A$ . Then the price of boots  $x$  decreases, causing her to consume at point  $B$ . To determine income and substitution effects, which intermediate point should be used to yield the correct result?  $C$  or  $D$ ? Are both ok? (*Hint: old utility, new prices.*)
- (c) Suppose Kathleen is initially consuming at point  $B$ . Then the price of boots  $x$  increases, causing her to consume at point  $A$ . To determine income and substitution effects in this case, which intermediate point should be used to yield the correct result?  $C$  or  $D$ ? Are both ok? (*Hint: old utility, new prices.*)