**I. MARGINAL PRINCIPLES**

The table below shows the relationships between different levels of a variable input and the corresponding output with all other inputs held constant. Complete the table and answer the questions that follow. Assume the variable input costs $2.00 each and the output sells for $3.00 each.



1. What is the profit-maximizing amount of input to use? Ans.\_\_\_\_ \_\_\_\_\_\_

2. What is the profit at this input level? (Show Work) Ans.\_\_\_ \_\_\_\_\_\_

3. What is the profit if 15 units of input are used? (Show work) Ans.\_\_\_ \_\_\_\_\_\_

4. Between 30 and 35 units of input, each additional unit of input:

 a) Increases income by $\_\_\_\_\_\_\_

 b) Increases cost by $\_\_\_\_\_\_\_\_

 c) Increases profit by $\_\_\_\_\_\_

5. If the input price was $1.00 instead of $2.00, which column(s) in the table would have different values?

6. What is the profit-maximizing input level if the output price increases to $5.00 each and input price is still $2.00?

 Ans.\_\_\_\_\_\_\_\_\_\_\_

7. Now assume the input is free, (i.e., you can have all you want at no cost).

 a) What is the marginal input cost in this situation?

 Ans.\_\_\_\_\_\_\_\_\_\_\_\_\_

 b) How much input should be used to maximize profit?

 Ans.\_\_\_\_\_\_\_\_\_\_\_\_\_

**II.** **DETERMINING OPTIMAL FEED USE**

 Feed‑gain relationships for hogs in drylot are reported in the table below. (All other inputs held constant). Complete the table and answer the questions below. Assume feed costs $6.75 per 100 lb. unit and hogs sell for $45 per cwt. ($.45 lb.)

1. What is the profit‑maximizing amount of feed to use? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_units

2. With a feed cost of $9.00 per unit, how much should be used:

 a) When hogs sell for $45/cwt? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ units

 b) When hogs sell for $40/cwt? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ units

3. Now assume a farmer can acquire any amount of feed at no cost.

1. How much feed should be used under these conditions?

 b) What is the marginal input cost of feed under these conditions? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_