



Microeconomics Unit 5

Free Response Questions

FRQ #1- The table shows the production function for a waffle restaurant called The Noble Steed. The restaurant hires workers in a perfectly competitive labor market with an equilibrium wage of \$25. Assume that the restaurant can sell waffles for \$10 each and that their fixed cost is \$50. See video in [Ultimate Review Packet](#) for detailed explanations.

Number of Workers	Total Waffles
0	0
1	10
2	25
3	35
4	40
5	43
6	45
7	40

- (a) Calculate the marginal revenue product of the 3rd worker. Show your work. **\$100.**
 $MRP = MP \times P$. The 3rd worker generates 10 additional waffles that can be sold for \$10 each. $10 \times \$10 = \100 .
- (b) How many workers should the restaurant hire to maximize profit? Explain. **5 workers.** The firm should hire where $MRP = MRC$. The marginal revenue product of the 6th worker is only \$20 ($2 \times \10) so the firm should not hire him since the additional cost (wage \$25) is greater than the additional revenue he generates.
- (c) Calculate the total cost of labor for the restaurant. Show your work. **\$125.** The cost of labor is the wage times the number of workers. The wage is \$25 and the firm hires 5 workers so the total cost of labor is \$125.
- (d) If the price of waffles increased and the wage stayed the same, would the number of workers hired by the restaurant increase, decrease, or stay the same? Explain. **The number of workers hired would increase.** Each worker could generate more revenue so the MRP of each worker will increase. The MRP will shift to the right.
- (e) Assume instead that the market wage increased to \$35.
- (i) Identify the number of workers that the restaurant will hire to maximize profit. **4 workers.** The firm should hire where $MRP = MRC$.
- (ii) If the cost of labor is the only variable cost, calculate the total profit earned by the firm when it hires the profit maximizing quantity of workers. Show your work. **\$210.** Profit = TR - TC. The total revenue is \$400 since the firm makes 40 units and sells them for \$10 each. The cost of labor is \$140 (the wage of \$35 times 4 workers) and the fixed cost is \$50 (given above). $\$400 - \190 makes the profit \$210.

FRQ #2- Antonio is an avocado farmer that hires unskilled labor in a perfectly competitive factor market.

- (a) Draw correctly labeled side-by-side graphs for the labor market and Antonio's firm. Show each of the following.
- (i) The equilibrium wage and quantity in the market, labeled WE and QE. **See graph below**
- (ii) The quantity of workers hired by Antonio's firm, labeled QF. **See graph below**
- (b) If Antonio hires a quantity of workers that is less than QF, will the marginal factor cost of the last worker hired increase, decrease, or stay the same? Explain. **The marginal factor cost will stay the same.** Since this is a perfectly competitive labor market the workers are wage takers and the wage is constant.
- (c) Assume instead that Antonio is the first company to develop a new technique that increases the productivity of his workers. Will the number of workers that Antonio hires increase, decrease, or stay the same? Explain. **Increase.** The marginal product of each worker will increase and the MRP for the firm will shift to the right. Each worker becomes more valuable to the firm.
- (d) Now assume that the government places a legally binding minimum wage on unskilled workers. Draw a new graph for the labor market and show each of the following.
- (i) The minimum wage labeled, W1. **See graph below. Must be above equilibrium.**
- (ii) The quantity of unskilled labor hired in the labor market as a result of the minimum wage, labeled Q1.

