Excel Activity **Weeks 13-14** **MATH 422 Math for Business Applications**

Learning Goals

Students will learn to calculate total revenue, marginal revenue, total cost, marginal cost, and profit for a perfectly competitive firm. They will use this information to determine the profit-maximizing level of output (quantity).

Directions:

Profit Maximization for a Perfectly Competitive Firm

1. Fill in price **of $50 in cells A3 to A17** and enter values of **0 – 14 for quantity in cells B3 to B17**.
2. ENTER the correct formula for Total **Revenue = Price * Quantity** in column C
3. ENTER the correct amount for **Marginal Revenue into cells D3 to D16**
4. ENTER the formulas for Total Cost and Marginal Cost using these formulas:
    a. **Total Cost = $20 + 10Q + 2Q^2$ and Marginal Cost = $10 + 4Q$**
    b. Make sure to use CELL references in all formulas!
    c. Recall: The **Constant (20)** in the formula for Total Cost is the "**Fixed Cost**"!
5. ENTER a formula for **Profit = Total Revenue – Total Cost into cells G3 to G16**
6. Find the **profit maximizing output**. Verify the **Marginal Revenue = Marginal Cost**
7. HIGHLIGHT the ROW using YELLOW that shows the desired profit maximizing output.

8. **Repeat Steps 1-7** on a new tab in the spreadsheet by changing the **Fixed Cost to $30**. Show how profit maximization is changed if fixed cost changes. **Why does it change in this manner?**

9. **Repeat Steps 1-7** on a new tab in the spreadsheet by changing the **Total Cost and Marginal Cost formulas. Cost = $20 + 15Q + 1.75Q^2$** and **Marginal Cost = $15 + 3.5Q$**. Show how profit maximization is changed if cost and marginal cost changes. **Why does it change in this manner?**

10. **Repeat Steps 1-7** on a new tab in the spreadsheet by changing the **PRICE to $42**. Show how profit maximization is changed if the price changes. Use the same formulas for Total cost and Marginal cost as before. **Why does it change in this manner?**