Problem Set #6
Firms' Costs

Scenario
The figure below shows the total cost curve for Mama's Gourmet Pizza:

**Question 1.1**

1.1. What is the total fixed cost of production (per day)?

$ 
Please enter a whole number, with no decimal point.
**Question 1.2**

1.2. Use the plotting tool to place an orange square at the point on the total cost curve that corresponds to average variable cost = $10. (Hint: This is the lowest value of average variable cost for Mama's Gourmet Pizza.)
Question 1.3

1.3. Assume that higher rent and increased property taxes raise daily production costs for Mama's Gourmet Pizza by $1000 (regardless of the number of pizzas produced). To show the effect of this tax, plot the new cost curve using the orange squares.

Scenario

When Better Beds produces 40 beds per day, its average variable cost is $600, its average total cost is $800, and its marginal cost is $700.
**Question 2.1**

2.1. Based on this information, plot Better Beds' average fixed cost curve for output levels of 20 and 40 beds per day.

**Question 2.2**

2.2. When Better Beds increased production from 39 to 40 beds per day:

- A. Average total cost remained at $800 per day.
- B. Average total cost fell.
- C. Average total cost rose.
- D. There is no way to know how average total cost changed.
Question 3

3. Cousin Cletus, an amateur sculptor, has a fixed cost of $60 per week and the total variable cost schedule (TVC) shown below:

<table>
<thead>
<tr>
<th>Sculptures (Number per week)</th>
<th>Total Variable Cost (Dollars per week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>120</td>
</tr>
<tr>
<td>2</td>
<td>220</td>
</tr>
<tr>
<td>3</td>
<td>330</td>
</tr>
<tr>
<td>4</td>
<td>460</td>
</tr>
<tr>
<td>5</td>
<td>640</td>
</tr>
</tbody>
</table>

Using the blue circles, plot values of average total cost for one through five sculptures. On the same diagram, use the orange squares to plot values of marginal cost. If the values of average total cost and marginal cost coincide for some level of output, you should have two symbols on the same grid point, with one covering up the other.
**Scenario**

In the long run, the Martha Mowers can assemble 300 mowers per week at a total cost of $18,000, 400 mowers at a total cost of $24,000, or 500 mowers at a cost of $35,000.
**Question 4.1**

4.1. Plot points of the long-run average cost curve for these three levels of output.

**Question 4.2**

4.2. For long-run output between 400 and 500 lawn mowers, Martha Mowers experiences:

- A. Economies of scale
- B. Diseconomies of scale
- C. Constant returns to scale

**Scenario:**

Suppose the market for nuts, (the edible kind), in Georgetown is perfectly competitive, and is given by the following equations:

Demand: \( Q = 110 - P \) Weekly Demand
Supply: \( Q = 10P \) Total Supply of All Nut Stores

**Question 5.1**

5.1. What is the equilibrium price of nuts in Georgetown? (Do not worry if the prices are not ?realistic.?)

Please enter a whole number, with no decimal point.

**Question 5.2**
5.2. What is the equilibrium quantity of nuts in Georgetown? (Do not worry if the quantities are not realistic.)

Please enter a whole number, with no decimal point.

**Question 5.3**

5.3. You work for John Astro who owns a typical nut store in Georgetown. John’s store produces and sells Astronuts with the following cost structure:

\[ TC = 25 + q^2 \]
\[ MC = 2q \]

where \( q \) is quantity of packages of nuts that Astronuts produces.

What is the fixed cost of Astronuts? ___________

Please enter a whole number, with no decimal point.

**Question 5.4**

5.4. Assuming Astronuts behaves as a profit-maximizing firm in a perfectly competitive market, how many packages of nuts will they produce?

Please enter a whole number, with no decimal point.

**Question 5.5**

5.5. What is the total revenue of Astronuts?

Please enter a whole number, with no decimal point.

**Question 5.6**

5.6. What are the total costs for Astronuts?

Please enter a whole number, with no decimal point.

**Question 5.7**

5.7. What is Astronuts’ average total cost (ATC)?

Please enter a whole number, with no decimal point.
**Question 5.8**

5.8. What is Astronuts' marginal cost (MC)?

Please enter a whole number, with no decimal point.

**Question 5.9**

5.9. What is Astronuts' profit?

Please enter a whole number, with no decimal point.

**Question 5.10**

5.10. If all other nut stores in this perfectly competitive market in Georgetown have identical cost curves and behave exactly like Astronuts, how many nut stores will there be in long-run equilibrium?

Please enter a whole number, with no decimal point.

**Scenario:**

Suppose Ben Bernanke, bored with his job as chairman of the Federal Reserve Board (FRB), is thinking about quitting running the national monetary policy to pursue his true ambition: driving a taxi cab. He has done some thinking about the taxi business, and knows that he will need to pay $15,000 per year for a taxi license, and $5,000 per year for gasoline. Bernanke figures his revenues will be $84,000 per year. He knows he will also need to purchase a taxicab. These sell for $30,000, but they depreciate at $4000 per year. So next year Bernanke could sell the cab for $26,000 if he chooses. Bernanke has $20,000 in his savings account that he can use to purchase the cab, so he needs to borrow the remaining cost. The current interest rate, at which Bernanke can borrow or lend money, is 10 percent per year.

To go into the taxi business, Bernanke would need to quit his current job, in which he works as Chairman of the Board of Governors of the Federal Reserve Bank of the United States. We don't know his salary for the position, but let's assume it is $45,000 per year.

One more thing: assume Ben can pay for the license and gasoline on a day-by-day basis during the year. He doesn't have to pay for those items up front, before he starts driving. The car, of course, he needs on day one.

**Question 6.1**

6.1. Calculate Bernanke's total economic profits for his taxi business for one year.

Please enter a whole number, with no decimal point.

**Question 6.2**

6.2. Which is better for Bernanke financially, driving a cab or running the global economy?
A. Cab
B. Fed Chairman