Break Even Analysis

You are the marketing manager for Pineapple Computers and are in charge of launching a new product – the Y-Phone. So far, the company has invested $250,000 in a new plant to produce the Y-Phone. Each Y-Phone costs the company $10 to build, and your customer focus groups have told you that you can sell the Y-Phone for no more than $200 each.

Mr. James Buffet, CEO of Pineapple Computers, asks you to tell the Board of Directors how many Y-Phones must be sold to recover production costs and when profitability will begin. The Board would like to see a graph depicting the break even point, and they would like to have the exact quantity value.

Your task is to construct a graph showing total revenue and total cost with a label identifying the exact value of the break even point.

Identify the following values:

Fixed Cost: $250,000

Variable Cost: $10

Price/unit: $200

Substitute the known values into the equations below to solve for total revenue (TR), total cost (TC), and break even point. Substitute your own values for Q starting at 500. *Hint: Increment* $Q \geq 100$.

Total Revenue = \( \frac{\text{Price}}{\text{Unit}} \cdot \text{Quantity} \)

<table>
<thead>
<tr>
<th>Q</th>
<th>500</th>
<th>600</th>
<th>700</th>
<th>800</th>
<th>900</th>
<th>1000</th>
<th>1100</th>
<th>1200</th>
<th>1300</th>
<th>1400</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR ($)</td>
<td>100000</td>
<td>120000</td>
<td>140000</td>
<td>160000</td>
<td>180000</td>
<td>200000</td>
<td>220000</td>
<td>240000</td>
<td>260000</td>
<td>280000</td>
</tr>
</tbody>
</table>

Total Cost = Fixed Cost + (Variable Cost \cdot Quantity)

<table>
<thead>
<tr>
<th>Q</th>
<th>500</th>
<th>600</th>
<th>700</th>
<th>800</th>
<th>900</th>
<th>1000</th>
<th>1100</th>
<th>1200</th>
<th>1300</th>
<th>1400</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC ($)</td>
<td>255000</td>
<td>256000</td>
<td>257000</td>
<td>258000</td>
<td>259000</td>
<td>260000</td>
<td>261000</td>
<td>262000</td>
<td>263000</td>
<td>264000</td>
</tr>
</tbody>
</table>

Recall that the break even point is where total revenue and total costs are equivalent (TR=TC). Also, recall that total revenue is the product of selling price/unit and quantity (PQ), and total...
costs are the sum of fixed cost and variable cost times quantity \( (F + VQ) \). Expressing the break even point in terms of total revenue and total cost yields the following equation:

\[
PQ = F + (VQ)
\]

Solving for \( Q \):

\[
PQ - VQ = F
\]
\[
Q(P-V) = F
\]
\[
Q = \frac{FC}{P-VC} \quad \text{or Break Even Point (BEP)}
\]

Using the known values of \( F \), \( P \) and \( V \) calculate, in the space below, the break even point \( (BEP) \).

\[
BEP = \frac{\$250,000}{\$200 - \$10} = 1315.78 \text{ or 1316 units}
\]

Use the blank graph below to graph total revenue and total cost from the tables above. Label the break even point \( (TR=TC) \).