OBJECTIVE: To determine whether we should purchase a piece of machinery or equipment, or whether we should rent or lease the services of such machinery or equipment.

EXAMPLE: We have a field of corn to harvest soon, and we are trying to figure out whether it is more economical to buy and use our own combine OR to use a custom combining service.

Cost of combine $60,000
Expected useful life 12 years
Salvage value $20,000
Custom rate $50.00 /ac.
1. **ANNUAL OWNERSHIP COSTS:**

   a. **Depreciation**
      
      \[
      \text{Depreciation} = \frac{\text{cost} - \text{salvage value}}{\text{useful life}} = \frac{\$60,000 - \$20,000}{12 \text{ years}}
      \]
      
      \[= \$3,333.33 / \text{year} \]

   b. **Interest**
      
      \[
      \text{Interest} = \frac{\text{Cost} + \text{salvage value}}{2} \times \text{interest rate}
      \]
      
      \[= \frac{\$60,000 + \$20,000}{2} \times .08 = \$3,200.00 / \text{year} \]

   c. **Insurance**
      
      \[
      \text{Insurance} = \frac{\text{Cost} + \text{salvage value}}{2} \times \text{insurance rate}
      \]
      
      \[= \frac{\$60,000 + \$20,000}{2} \times .008 = \$320.00 / \text{year} \]
d. Property taxes = \( \frac{(\text{Cost} + \text{salvage value}) \times \text{local tax rate}}{2} \)

\[
= \frac{(60,000 + 20,000) \times 0.00445}{2} = \$178.00
\]

Total annual ownership costs \( \$7,031.33 \) /year

e. If I have 10 acres then \( \$703.13 \) will be ownership cost per acre

\[
\begin{array}{ll}
100 & \$ 70.31 \\
1000 & \$ 7.03 \\
\end{array}
\]

2. OPERATING COST: Assume \( \$8.50 \) per acre

3. Therefore, if you have 1000 acres, it will pay to buy a combine:

\( \$15.53 \) /ac. vs. \( \$50.00 \) /ac.
At what acreage would I "BREAKEVEN" with respect to buying a combine versus using a custom combining service?

<table>
<thead>
<tr>
<th>ACRES</th>
<th>ANNUAL OWNERSHIP COST PER ACRE</th>
<th>OPERATING COST PER ACRE</th>
<th>TOTAL COST OF OWNING AND OPERATING PER ACRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>$140.63</td>
<td>$8.50</td>
<td>$149.13</td>
</tr>
<tr>
<td>100</td>
<td>70.31</td>
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<td>8.50</td>
<td>29.39</td>
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<tr>
<td>400</td>
<td>17.58</td>
<td>8.50</td>
<td>26.08</td>
</tr>
</tbody>
</table>

At what acreage is it economical to purchase a combine?
Note: If 400 acres was all I could do with one combine in a season, it
would pay to purchase my own. But if I owned 550 acres, then
it would pay to purchase one combine and have the remaining 150
acres custom combined.

If I had 700 acres, it would pay to buy 2 combines.

Each time you exceed your limit of production with a machine, you
must re-evaluate the remaining output level to see whether it pays
to buy another machine or use custom service.
Using the previous example, assume you only have 100 acres:

Cost of combining with own machine = $78.81 /ac.

How many acres would I have to custom harvest to make my investment profitable?

1. Total revenue from each acre harvested $50.00
   Operating cost for each acre $ 8.50
   Total net operating revenue /acre $41.50
2. Total cost for own operation:

Ownership cost $7,031.33/year

Operating expense $850.00/year

Total cost $7,881.33/year

Less the value of combining own land $5,000.00/year

Balance to be covered by custom combine enterprise to break-even $2,881.33/year
3. Custom break-even acreage = $2,881.33 /year / $41.50 /ac. = 69.43 acres.

FORMULA FOR COMPUTING BREAK-EVEN ACREAGE:

\[
\text{Total annual ownership cost} \quad \frac{\text{---}}{\text{(custom rate /ac.)} - (\text{operating cost /ac.})}
\]

An example:

\[
\begin{align*}
\text{B.A.} &= \frac{\$7031.33 \text{ /year}}{\$50 \text{ /ac.} - \$8.50 \text{ /ac.}} = 169.43 \text{ ac./yr} \\
\end{align*}
\]