P6–12 Basics of CVP Analysis  Feather Friends, Inc., makes a high-quality wooden birdhouse that sells for $20 per unit. Variable costs are $8 per unit, and fixed costs total $180,000 per year.

Answer the following independent questions:

1. What is the product’s CM ratio?
2. Use the CM ratio to determine the break-even point in sales dollars.
3. Due to an increase in demand, the company estimates that sales will increase by $75,000 during the next year. By how much should net income increase (or net loss decrease) assuming that fixed costs do not change?
4. Assume that the operating results for last year were:

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Sales</td>
<td>$400,000</td>
</tr>
<tr>
<td>Less variable expenses</td>
<td>160,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>240,000</td>
</tr>
<tr>
<td>Less fixed expenses</td>
<td>180,000</td>
</tr>
<tr>
<td>Net income</td>
<td>$ 60,000</td>
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a. Compute the degree of operating leverage at the current level of sales.
b. The president expects sales to increase by 20% next year. By what percentage should net income increase?

5. Refer to the original data. Assume that the company sold 18,000 units last year. The sales manager is convinced that a 10% reduction in the selling price, combined with a $30,000 increase in advertising, would cause annual sales in units to increase by one-third. Prepare two contribution income statements, one showing the results of last year’s operations and one showing the results of operations if these changes are made. Would you recommend that the company do as the sales manager suggests?

6. Refer to the original data. Assume again that the company sold 18,000 units last year. The president does not want to change the selling price. Instead, he wants to increase the sales commission by $1 per unit. He thinks that this move, combined with some increase in advertising, would increase annual sales by 25%. By how much could advertising be increased with profits remaining unchanged? Do not prepare an income statement, use the incremental analysis approach.
1. \( \frac{100\% - 40\% - 12\%}{60\%} = \frac{58\%}{60\%} \) \( \frac{300,000}{180,000} = 60\% \) \( 180,000 \div 60\% = 300,000 \) \( \frac{300,000}{2} = \text{BE} \)

2. \( \frac{S - 8}{12} \)

3. \( \frac{(S + 75,000)}{60\%} = \frac{CM + 45,000}{NI} \)

4a. \( 0L = \frac{CM}{NI} = \frac{240,000}{60,000} = 4 \)

4b. \( \frac{4 \times 20\%}{80\% \text{ increase in NI}} \)
### Problem 6.12

#### Question 5

<table>
<thead>
<tr>
<th>Units</th>
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<tbody>
<tr>
<td>20</td>
<td></td>
</tr>
<tr>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>VC</td>
<td>-8</td>
</tr>
<tr>
<td>CM</td>
<td>12</td>
</tr>
<tr>
<td>FC</td>
<td>-180,000</td>
</tr>
</tbody>
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**Answer:** No

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</thead>
<tbody>
<tr>
<td></td>
<td>18,000</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>20</td>
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<td>18</td>
<td>432,000</td>
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<tr>
<td>5</td>
<td>144,000</td>
<td></td>
<td>8</td>
<td>192,000</td>
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<tr>
<td>VC</td>
<td>216,000</td>
<td></td>
<td>10</td>
<td>240,000</td>
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**Answer:** Yes

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<tbody>
<tr>
<td></td>
<td>-210,000</td>
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<tr>
<td>30,000</td>
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**Increase in FC:**

\[180,000 \times 1.25 = 216,000 \]