E6.10 (LO [2](https://jigsaw.vitalsource.com/books/9781119390459/epub/OPS/c06.xhtml?favre=brett#c06-feafxd-0102)), AP Personal Electronix sells computer tablets and MP3 players. The business is divided into two divisions along product lines. CVP income statements for a recent quarter's activity are presented below.

*Determine break-even point in dollars for two divisions*.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Tablet Division | MP3 Player Division | Total |
| Sales | $600,000 | $400,000 | $1,000,000 |
| Variable costs | 420,000 | 260,000 | 680,000 |
| Contribution margin | $180,000 | $140,000 | 320,000 |
| Fixed costs |  |  | 120,000 |
| Net income |  |  | $200,000 |

#### **Instructions**

a. Determine the sales mix percentage based on sales revenue and contribution margin ratio for each division.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Tablet | MP3 |
| A | Sales | 600,000 | 400,000 |
| B | Total Sales | 1,000,000 | 1,000,000 |
| C=(A/B)\*100 | Sales Mix % | 60% | 40% |
| D | Contribution Margin | 180,000 | 140,000 |
| E = (D/A) \*100 | CM Ratio | 30% | 35% |

b. Calculate the company's weighted-average contribution margin ratio.

= (30 % \*60%) + (35%\*40%)

= 18% + 14%

= 32%

c. Calculate the company's break-even point in dollars.

= $120,000 Fixed Cost / 32% CM Ratio

= $375,000

d. Determine the sales level in dollars for each division at the break-even point.

Tablets = $375,000 \*60% = $225,000

MP3 player = $375,000 \*40% = $150,000

E6.15 (LO [4](https://jigsaw.vitalsource.com/books/9781119390459/epub/OPS/c06.xhtml?favre=brett#c06-feafxd-0104)), AN Casas Modernas of Juarez, Mexico, is contemplating a major change in its cost structure. Currently, all of its drafting work is performed by skilled draftsmen. Rafael Jiminez, Casas' owner, is considering replacing the draftsmen with a computerized drafting system. However, before making the change, Rafael would like to know the consequences of the change, since the volume of business varies significantly from year to year. Shown below are CVP income statements for each alternative.

*Compute degree of operating leverage and evaluate impact of alternative cost structures on net income and margin of safety*.

|  |  |  |
| --- | --- | --- |
|  | Manual  System | Computerized  System |
| Sales | $1,500,000 | $1,500,000 |
| Variable costs | 1,200,000 | 600,000 |
| Contribution margin | 300,000 | 900,000 |
| Fixed costs | 100,000 | 700,000 |
| Net income | $200,000 | $200,000 |

#### **Instructions**

a. Determine the degree of operating leverage for each alternative.

Degree of Operating Leverage = contribution margin / Net Income

Manual = $300,000/$200,000 = 1.5

Computerized = $900,000/$200,000 = 4.5

b. Which alternative would produce the higher net income if sales increased by $150,000?

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Manual | Computerized |
| A | Contribution Margin | 300,000 | 900,000 |
| B | Sales | 1,500,000 | 1,500,000 |
| C = A/B | CM Ratio | 20 % | 60 % |
| D | Increase in sales | 150,000 | 150,000 |
| E = C\*D | Increase in Net Income | 30,000 | 90,000 |

The Computerized system would provide the Higher Net Income.

c. Using the margin of safety ratio, determine which alternative could sustain the greater decline in sales before operating at a loss.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Manual | Computerized |
| A | Fixed Cost | 100,000 | 700,000 |
| B | CM Ratio | 20 % | 60 % |
| C = A/B | Break-even sales | $500,000 | 1,166,667 |
|  |  |  |  |
| D | Current Sales | 1,500,000 | 1,500,000 |
| E = D-C | Margin of safety | 1,000,000 | 333,333 |
| F = (E/D) \*100 | MOF % of Sales | 66.67% | 22.22% |

The margin of Safety % of manual is more, therefore, the manual system alternative can sustain a greater decline.