E7.4 (LO [2](https://jigsaw.vitalsource.com/books/9781119390459/epub/OPS/c07.xhtml?favre=brett#c07-sec-0011)), AN Klean Fiber Company is the creator of Y-Go, a technology that weaves silver into its fabrics to kill bacteria and odor on clothing while managing heat. Y-Go has become very popular in undergarments for sports activities. Operating at capacity, the company can produce 1,000,000 Y-Go undergarments a year. The per unit and the total costs for an individual garment when the company operates at full capacity are as follows.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Per Undergarment |  | Total |
| Direct materials |  | $2.00 |  | $2,000,000 |
| Direct labor | 0.75 | 750,000 |
| Variable manufacturing overhead | 1.00 | 1,000,000 |
| Fixed manufacturing overhead | 1.50 | 1,500,000 |
| Variable selling expenses | 0.25 | 250,000 |
| Totals | $5.50 | $5,500,000 |

*Use incremental analysis for special order*.

The U.S. Army has approached Klean Fiber and expressed an interest in purchasing 250,000 Y-Go undergarments for soldiers in extremely warm climates. The Army would pay the unit cost for direct materials, direct labor, and variable manufacturing overhead costs. In addition, the Army has agreed to pay an additional $1 per undergarment to cover all other costs and provide a profit. Presently, Klean Fiber is operating at 70% capacity and does not have any other potential buyers for Y-Go. If Klean Fiber accepts the Army’s offer, it will not incur any variable selling expenses related to this order.

#### **Instructions**

Using incremental analysis, determine whether Klean Fiber should accept the Army’s offer.

|  |  |  |
| --- | --- | --- |
|  | Per unit | Total |
| Incremental rev | 4.75 | 1,187,500 |
| Incremental cost |  |  |
| Direct material | 2.00 | -500,000 |
| Direct labor | .75 | -187,500 |
| Variable overhead | 1.00 | -250,000 |
| Total Variable Cost | 3.75 | 937,500 |
| Incremental profit |  | 250,000 |

Yes, the company should accept the Army’s offer.

E7.6 (LO [3](https://jigsaw.vitalsource.com/books/9781119390459/epub/OPS/c07.xhtml?favre=brett#c07-sec-0013)), E Jobs, Inc. has recently started the manufacture of Tri-Robo, a three-wheeled robot that can scan a home for fires and gas leaks and then transmit this information to a smartphone. The cost structure to manufacture 20,000 Tri-Robos is as follows.

|  |  |
| --- | --- |
|  | Cost |
| Direct materials ($50 per robot) | $1,000,000 |
| Direct labor ($40 per robot) | 800,000 |
| Variable overhead ($6 per robot) | 120,000 |
| Allocated fixed overhead ($30 per robot) | 600,000 |
| Total | $2,520,000 |

*Use incremental analysis for make-or-buy decision*.

Jobs is approached by Tienh Inc., which offers to make Tri-Robo for $115 per unit or $2,300,000.

#### **Instructions**

a. Using incremental analysis, determine whether Jobs should accept this offer under each of the following independent assumptions.

1. Assume that $405,000 of the fixed overhead cost can be avoided.

|  |  |  |  |
| --- | --- | --- | --- |
| Details | In-house | Out Source | Incremental cost |
| Total cost to manufacture | 2,520,000 | 2,300,000 | 220,000 |
| Unavoidable fixed costs | - | 195,000 | (195,000) |
| total | 2,520,000 | 2,495,000 | 25,000 |

The incremental cost in the in-house manufacturing is positive it will cost $25,000 more to manufacture the Tri-Robo in-house for Jobs INC. Therefore using this incremental analysis Job INC should accept the offer from Tienh INC.

2. Assume that none of the fixed overhead can be avoided. However, if the robots are purchased from Tienh Inc., Jobs can use the released productive resources to generate additional income of $375,000.

|  |  |  |  |
| --- | --- | --- | --- |
| Details | in -house | Outsource Tienh INC | Incremental cost |
| Total cost to manufacture | 2,520,000 | 2,300,000 | 220,000 |
| Unavoidable fixed cost | - | 600,000 | (600,000) |
| Additional income from released resources |  | (375,000) | 375,000 |
| Total | 2,520,000 | 2,525,000 | (5,000) |

This shows that it will now cost $5,000 less to manufacture the robots in-house and therefore they should not accept the offer from Tienh INC.

3. Describe the qualitative factors that might affect the decision to purchase the robots from an outside supplier.

Some qualitative factors that should be considered before making a decision to purchase the product from outside suppliers include layoffs, cost of closing production lines, reputation and reliability of the supplier, and the relationship with customers.

E7.9 (LO [4](https://jigsaw.vitalsource.com/books/9781119390459/epub/OPS/c07.xhtml?favre=brett#c07-sec-0017)), AN Anna Garden recently opened her own basketweaving studio. She sells finished baskets in addition to selling the raw materials needed by customers to weave baskets of their own. Unfortunately, owing to space limitations, Anna is unable to carry all varieties of kits originally assembled and must choose between two basic packages.

The Basic Kit includes undyed, uncut reeds (with dye included) for weaving one basket. This basic package costs Anna $16 and sells for $30. The second kit, called Stage 2, includes cut reeds that have already been dyed. With this kit the customer need only soak the reeds and weave the basket. Anna produces the Stage 2 kit by using the materials included in the Basic Kit. Because she is more efficient at cutting and dying reeds than her average customer, Anna is able to produce two Stage 2 kits in one hour from one Basic Kit. (She values her time at $18 per hour.) The Stage 2 kit sells for $36.

Instructions

Determine whether Anna’s basketweaving studio should carry the Basic Kit with undyed and uncut reeds or the Stage 2 kit with reeds already dyed and cut. Prepare an incremental analysis to support your answer.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Sell (basic kit) | Process Further (Stage 2 Kit) | Net income increase / (decrease) |
| Sales per unit | $30 | $36 | $6 |
| Cost per unit: |  |  |  |
| Direct materials | $16 | 16/2 = $8 | $8 |
| Direct labor | 0 | 18/2 = $9 | ($9) |
| Total | $16 | $17 | ($1) |
| Net Income per Unit | $14 | $19 | $5 |

Based on this analysis, Anna should carry the Stage 2 Kit as the net income is increased by $5.

E7.14 (LO [5](https://jigsaw.vitalsource.com/books/9781119390459/epub/OPS/c07.xhtml?favre=brett#c07-sec-0021)), AN Johnson Enterprises uses a computer to handle its sales invoices. Lately, business has been so good that it takes an extra 3 hours per night, plus every third Saturday, to keep up with the volume of sales invoices. Management is considering updating its computer with a faster model that would eliminate all of the overtime processing.

*Use incremental analysis for retaining or replacing equipment decision*.

|  |  |  |
| --- | --- | --- |
|  | Current Machine | New Machine |
| Original purchase cost | $15,000 | $25,000 |
| Accumulated depreciation | $ 6,000 | — |
| Estimated annual operating costs | $25,000 | $20,000 |
| Remaining useful life | 5 years | 5 years |

If sold now, the current machine would have a salvage value of $6,000. If operated for the remainder of its useful life, the current machine would have zero salvage value. The new machine is expected to have zero salvage value after 5 years.

#### **Instructions**

Prepare an incremental analysis to determine whether the current machine should be replaced.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Retain | Replace | Net Income |
| Operating Costs | 25,000\*5 = 125,000 | 20,000\*5=100,000 | 25,000 |
| New machine cost | 0 | 25,000 | (25,000) |
| Salvage Value | 0 | (6000) | 6000 |
| Total | 125,000 | 119,000 | 6000 |

Net income would increase by $6000 if the current machine is replaced.

E7.16 (LO [6](https://jigsaw.vitalsource.com/books/9781119390459/epub/OPS/c07.xhtml?favre=brett#c07-sec-0023)), Cawley Company makes three models of tasers. Information on the three products is given below.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Tingler | Shocker | Stunner |
| Sales | $300,000 | $500,000 | $200,000 |
| Variable expenses | 150,000 | 200,000 | 145,000 |
| Contribution margin | 150,000 | 300,000 | 55,000 |
| Fixed expenses | 120,000 | 230,000 | 95,000 |
| Net income | $ 30,000 | $ 70,000 | $(40,000) |

Fixed expenses consist of $300,000 of common costs allocated to the three products based on relative sales, as well as direct fixed expenses unique to each model of $30,000 (Tingler), $80,000 (Shocker), and $35,000 (Stunner). The common costs will be incurred regardless of how many models are produced. The direct fixed expenses would be eliminated if that model is phased out.

James Watt, an executive with the company, feels the Stunner line should be discontinued to increase the company’s net income.

Instructions

a. Compute current net income for Cawley Company.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Tingler | shocker | stunner | total |
| Sales | 300,000 | 500,000 | 200,000 | 1,000,000 |
| Variable expense | 150,000 | 200,000 | 145,000 | 495,000 |
| Contribution margin | 150,000 | 300,000 | 55,000 | 505,000 |
| Fixed expense | 120,000 | 230,000 | 95,000 | 445,000 |
| Net operating margin | 30,000 | 70,000 | (40,000) | 60,000 |

Net Income = $60,000

b. Compute net income by product line and in total for Cawley Company if the company discontinues the Stunner product line. (*Hint:* Allocate the $300,000 common costs to the two remaining product lines based on their relative sales.)

|  |  |  |  |
| --- | --- | --- | --- |
|  | tingler | shocker | total |
| Sales | 300,000 | 500,000 | 800,000 |
| Allocation ratio | 0.357 | 0.625 | 1 |
| Allocation | 112,500 | 187,500 | 300,000 |

|  |  |  |  |
| --- | --- | --- | --- |
|  | tingler | shocker | total |
| Sales | 300,000 | 500,000 | 800,000 |
| V Expenses | 150,000 | 200,000 | 350,000 |
| CM | 150,000 | 300,000 | 450,000 |
| Common F Expense | 112,500 | 187,500 | 300,000 |
| Additional F Cost | 30,000 | 80,000 | 110,000 |
| Total Fixed Expenses | 142,500 | 267,500 | 410,000 |
| Net Income | 7500 | 32,500 | 40,000 |

c. Should Cawley eliminate the Stunner product line? Why or why not?

No, Cawley should NOT eliminate the Stunner product line because the allocated costs would decrease net income from $60,000 to $40,000. $20,000 is a lot of money.