Calista Company manufactures electronic equipment. In 2008, it purchased the special switches used in each of its products from an outside supplier. The supplier charged Calista $2 per switch. Calista’s CEO considered purchasing either machine X or machine Y so the company can manufacture its own switches. The CEO decided at the beginning of 2009 to purchase Machine X. The projected data for 2010 are:

<table>
<thead>
<tr>
<th>Machine</th>
<th>Machine X</th>
<th>Machine Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual fixed cost</td>
<td>$135,000</td>
<td>$204,000</td>
</tr>
<tr>
<td>Variable cost per switch</td>
<td>$0.65</td>
<td>$0.30</td>
</tr>
</tbody>
</table>

Supplier charge per switch = $2.00

**Required**

1. For machine X, what is the indifference point between purchasing the machine and purchasing from the outside vendor?
2. At what volume level should Calista consider purchasing Machine Y?
1. The answer is zero. The proper analysis is to compare the cost of purchasing machine X versus the cost of purchasing from the outside vendor. The analysis was as follows, showing that Calista should purchase machine X if volume is expected to exceed 100,000 units:

**Machine X**

\[ 2Q = 0.65Q + 135,000 \]

\[ Q = 100,000 \]

The answer is different for 11-34 since the cost of machine X is now a sunk cost, and thus, the unit cost of $0.65 is always preferred to the outside price of $2, irrespective of the volume, even for very low volume levels.

2. The threshold to moving up to machine Y is high because the purchase cost of machine X is sunk and irrelevant.

\[
\begin{align*}
\text{Cost of using } X & = \text{Cost of using } Y \\
0.65S & = 0.30S + 204,000 \\
0.35S & = 204,000 \\
S & = 582,857 \text{ units}
\end{align*}
\]
Award Plus Co. manufactures medals for winners of athletic events and other contests. Its manufacturing plant has the capacity to produce 10,000 medals each month; current monthly production is 7,500 medals. The company normally charges $175 per medal. Variable costs and fixed costs for the current activity level of 75 percent follow:

Variable costs
Manufacturing
  Labor $375,000
  Material $262,500
  Marketing $187,500
  Total variable costs $825,000
Fixed costs
  Manufacturing $275,000
  Marketing $175,000
  Total fixed costs $450,000
Total costs $1,275,000

Additional information:
Capacity (units) = 10,000 units per month
Current monthly output = 7,500
Current usage of available capacity = 75%
Normal selling price per unit = $175.00

Award Plus has just received a special one-time order for 2,500 medals at $100 per medal. For this particular order, no variable marketing costs will be incurred. Cathy Senna, a management accountant with Award Plus, has been assigned the task of analyzing this order and recommending whether the company should accept or reject it. After examining the costs, Senna suggested to her supervisor, Gerard LePenn who is the controller, that they request competitive bids from vendors for the raw materials since the current quote seems high. LePenn insisted that the prices are in line with other vendors and told her that she was not to discuss her observations with anyone else. Senna later discovered that LePenn is a brother-in-law of the owner of the current raw materials supply vendor.

Special-order details:
Number of units = 2,500
Selling price per unit = $100.00

1. Determine if Award Plus Co. should accept the special order and why.
2. Discuss at least three other considerations that Cathy Senna should include in her analysis of the special order.
3. Explain how Cathy Senna should try to resolve the ethical conflict arising out of the controller's insistence that the company avoid competitive bidding.
1.

<table>
<thead>
<tr>
<th>Description</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price of special order</td>
<td>$100</td>
</tr>
<tr>
<td>Relevant Cost</td>
<td>$(375,000 + 262,500) / 7,500 = 85</td>
</tr>
<tr>
<td>Contribution on special order</td>
<td>$15 per unit</td>
</tr>
<tr>
<td>$15 x 2,500 = $37,500 total contribution</td>
<td></td>
</tr>
</tbody>
</table>

Positive contribution: Accept the Special Order

2. Other considerations
   a. Is the order likely to lead to further regular business with this customer?
   b. Is the order in the strategic best interest of the firm, for example, will it support or undermine Award Plus’ desired image in the market?
   c. While Award Plus has just enough capacity to complete the special order, will there be other costs in addition to the variable manufacturing costs in order to complete the order, that is, special tooling or set up costs, etc
   d. See part 3. below
11-45
Assume the same information as for Problem 11-44, except that the $40 fixed manufacturing overhead consists of $15 per unit batch related costs and $25 per unit facilities level fixed costs. Also, assume that each new batch causes increased costs of $15,000 per batch; the remainder of the fixed costs do not vary with the number of units produced or the number of batches.

- **Batch related costs**: $15,000 per batch
- **Variable Manufacturing costs**: $20 per unit
- **Units in the special order**: 2,000 units
- **Special order price**: $30

**Required**
1. Calculate the relevant unit and total cost of the special order, including the new information about batch related costs.
2. If accepted, how would the special order affect Duvernoy’s operating income?
3. Suppose that Chen notifies Duvernoy it must reduce its order to 1,000 units because of changes in orders it has received. How would this change affect your answer in parts 1 and 2?
1. First, determine relevant batch related costs:
   The special order would cause one new batch, so the only relevant batch related cost is the cost per batch of $15,000 or $15 per unit.

Note: Total fixed costs are $40 x 10,000 = $400,000, composed of:
   - Batch related costs = $15 x 10,000 units = $150,000
   - Facilities related fixed costs = ($40 - $15) x 10,000 = $250,000
   - Total Fixed costs = $40 x 10,000 = $400,000

Cost per batch = $150,000/10 batches = $15,000

Relevant per unit costs for the special order
   - Variable manufacturing: $20.00
   - Batch related costs: $15,000/10,000 units = $7.50

Total unit relevant costs for the special order = $27.50

Total relevant cost for the special order = 2,000 x $27.50 = $55,000

2. The special order price of $30 exceeds the relevant cost of $27.50, so Duvernoy should accept the Chen offer since there is available capacity. Profit will increase by ($30 - $27.50) x 2,000 = $5,000.

   Alternatively, ($30 - $20) x 2,000 - $15,000 = $5,000

Notice that the increase in profits calculated here is less than in Problem 11-44 because we are taking into account the batch related costs.

3. If the Chen order is reduced from 2,000 to 1,000 units, then the batch related costs are the same in total, but the unit cost of batch level costs increases to $15 (= $15,000 per batch/1,000 units). The relevant costs are now:

Relevant costs for the special order
   - Variable manufacturing: $20
   - Batch related costs: $10,000/1,000 = $15

Total unit relevant costs for the special order = $35

Total relevant cost for the special order = 1,000 x $35 = $35,000

Now, the Chen special order should not be accepted because the unit cost ($35) is greater than the special order price ($30). The loss on the order would be ($35 - $30) x 1,000 = $5,000

Alternatively: $(30 - $20) x 1,000 - $15,000 = -$5,000