Problem 13-23 (60 minutes)

1. Selling price per unit $32
   Variable expenses per unit ..... 18 *
   Contribution margin per unit $14

   *$10.00 + $4.50 + $2.30 + $1.20 = $18.00

   Increased sales in units (60,000 units × 25%) 15,000
   Contribution margin per unit ..... × $14
   Incremental contribution margin $210,000
   Less added fixed selling expenses 80,000
   Incremental net operating income $130,000

   Yes, the increase in fixed selling expenses would be justified.

2. Variable manufacturing cost per unit ..... $16.80 *
   Import duties per unit 1.70
   Permits and licenses ($9,000 ÷ 20,000 units) 0.45
   Shipping cost per unit 3.20
   Break-even price per unit $22.15

   *$10 + $4.50 + $2.30 = $16.80.

3. The relevant cost is $1.20 per unit, which is the variable selling expense per Dak. Because the irregular units have already been produced, all production costs (including the variable production costs) are sunk. The fixed selling expenses are not relevant because they will be incurred whether or not the irregular units are sold. Depending on how the irregular units are sold, the variable expense of $1.20 per unit may not even be relevant. For example, the units may be disposed of through a liquidator without incurring the normal variable selling expense.

4. If the plant operates at 30% of normal levels, then only 3,000 units will be produced and sold during the two-month period:

   60,000 units per year × 2/12 = 10,000 units.
   10,000 units × 30% = 3,000 units produced and sold.

Problem 13-23 (continued)

Given this information, the simplest approach to the solution is:

Contribution margin lost if the plant is closed (3,000 units × $14 per unit*)		$(42,000)
Fixed costs that can be avoided if the plant is closed:		
Fixed manufacturing overhead cost ($300,000 × 2/12 = $50,000; $50,000 × 40%)	$20,000	
Fixed selling cost ($210,000 × 2/12 = $35,000; $35,000 × 20%)	7,000	27,000
Net disadvantage of closing the plant		$(15,000)

*$32.00 – ($10.00 + $4.50 + $2.30 + $1.20) = $14.00

Some students will take a longer approach such as that shown below:

	Continue to Operate	*Close the Plant*
Sales (3,000 units × $32 per unit)	$ 96,000	$ 0
Variable expenses (3,000 units × $18 per unit)	54,000	0
Contribution margin	42,000	0
Fixed expenses:		
Fixed manufacturing overhead cost:		
$300,000 × 2/12	50,000	
$300,000 × 2/12 × 60%		30,000
Fixed selling expense:		
$210,000 × 2/12	35,000	
$210,000 × 2/12 × 80%		28,000
Total fixed expenses	85,000	58,000
Net operating income (loss)	$(43,000)	$(58,000)

Problem 13-23 (continued)

5. The relevant costs are those that can be avoided by purchasing from the outside manufacturer. These costs are:

Variable manufacturing costs	$16.80
Fixed manufacturing overhead cost ($300,000 × 75% = $225,000; $225,000 ÷ 60,000 units).....	3.75
Variable selling expense ($1.20 × 1/3).....	0.40
Total costs avoided.....	$20.95

To be acceptable, the outside manufacturer's quotation must be *less* than $20.95 per unit.