12-22 (20 min.) Cost-plus target return on investment pricing.

1. Target operating income = target return on investment × invested capital

Target operating income (25% of $960,000)	$240,000	
Total fixed costs	352,000	
Target contribution margin	$592,000	
Target contribution per room, ($592,000 ÷ 16,000)	$37	
Add variable costs per room	3	
Price to be charged per room	$40	
Proof		
Total room revenues ($40 × 16,000 rooms)		$640,000
Total costs:		
Variable costs ($3 × 16,000)	$ 48,000	
Fixed costs	352,000	
Total costs		400,000
Operating income		$240,000

The full cost of a room = variable cost per room + fixed cost per room
The full cost of a room = $3 + ($352,000 ÷ 16,000) = $3 + $22 = $25

Markup per room = Rental price per room – Full cost of a room
= $40 – $25 = $15
Markup percentage as a fraction of full cost = $15 ÷ $25 = 60%

2. If price is reduced by 10%, the number of rooms Beck could rent would increase by 10%.

The new price per room would be 90% of $40	$36
The number of rooms Beck expects to rent is 110% of 16,000	17,600
The contribution margin per room would be $36 – $3	$33
Contribution margin ($33 ×17,600)	$580,800

Because the contribution margin of $580,800 at the reduced price of $36 is less than the contribution margin of $592,000 at a price of $40, Beck should not reduce the price of the rooms. Note that the fixed costs of $352,000 will be the same under the $40 and the $36 price alternatives and are, hence, irrelevant to the analysis.

12-26 (25 min.) Life-cycle product costing, activity-based costing.

1. The budgeted life-cycle operating income for the new watch MX3 is $2,420,000, as shown below.

	Life-Cycle Revenues And Costs
Revenues, $40 × 400,000	$16,000,000
R&D and design costs	1,000,000
Manufacturing costs:	
Variable, $15 × 400,000	6,000,000
Batch, $600 × 800[1] batches	480,000
Fixed	1,800,000
Marketing costs:	
Variable, $3.20 × 400,000	1,280,000
Fixed	1,000,000
Distribution costs:	
Batch, $280 × 2,500[2] batches	700,000
Fixed	720,000
Customer-service costs:	
Variable, $1.50 × 400,000	600,000
Total costs	13,580,000
Operating income	$ 2,420,000

[1] 400,000 watches ÷ 500 watches per batch = 800 batches
[2] 400,000 watches ÷ 160 watches per batch = 2,500 batches

2. Budgeted product life-cycle costs for R&D and design $1,000,000
Total budgeted product life-cycle costs $13,580,000

$$\text{Percentage of budgeted product life-cycle costs incurred till the R \& D and design stages} = \frac{\$1,000,000}{\$13,580,000} = 7.36\%$$

3. An analysis reveals that 80% of the total product life-cycle costs of the new watch will be locked in at the end of the R&D and design stages when only 7.36% of the costs are incurred (requirement 2). The implication is that it will be difficult to alter or reduce the costs of MX3 once Destin finalizes the design of MX3. To reduce and manage total costs, Destin must act to modify the design before costs get locked in.

4. The budgeted life-cycle operating income for MX3 if Destin reduces its price by $3 is $1,912,000, as shown next. This is less than the operating income of $2,420,000 calculated in requirement 1. Therefore, Destin should not reduce MX3's price by $3.

	Life-Cycle RevenuesAnd Costs
Revenues, $37 × 440,000	$16,280,000
R&D and design costs	1,000,000
Manufacturing costs:	
Variable, $15 × 440,000	6,600,000
Batch, $600 × 800[3] batches	480,000
Fixed	1,800,000
Marketing costs:	
Variable, $3.20 × 440,000	1,408,000
Fixed	1,000,000
Distribution costs:	
Batch, $280 × 2,500[4] batches	700,000
Fixed	720,000
Customer-service costs:	
Variable, $1.50 × 440,000	660,000
Total costs	14,368,000
Operating income	$ 1,912,000

[3] 440,000 watches ÷ 550 watches per batch = 800 batches
[4] 440,000 watches ÷ 176 watches per batch = 2,500 batches

12-27 (20–30 min.) Pricing of hotel rooms on weekends.

1. The three factors that Diamond should consider in pricing decisions are:

Customers. The major customers ("guests" to Diamond) of the Galaxy are business travelers who predominantly stay on a Sunday-through-Thursday basis. Diamond should consider two issues:

a. Will some of the $150/$180 a night customers staying Sunday through Thursday transfer their business to Friday or Saturday for reduced rates? If a sizable number of these customers can transfer their business to Friday or Saturday nights, Diamond should be reluctant to make sizable weekend price discounts.
b. Will a new set of customers be attracted to the Galaxy with a reduced weekend rate, people who would not be attracted at the $150/$180 a night rates?

The business customers of Galaxy likely will understand cost-volume-profit relationships for hotels and not be offended at different rates for different days of the week. "Off-peak" pricing is an accepted convention in many industries (such as in telecommunications and airlines).

Competitors. Many prestige hotels already offer sizable price discounts on weekends. Moreover, cuts of up to 50% are the nominal price discount. The additional items included in weekend packages (such as breakfast or a bottle of champagne) add to the effective price discount.

Costs. The variable costs of servicing each room are only $20 a night per single occupancy and $22 a night per double occupancy. Any room rate above these amounts will make a positive contribution to Galaxy's operating income.

It is an accepted convention that weekend rates at San Francisco's prestige hotels will be lowered on Friday and Saturday night. Diamond may want to offer moderate price reductions and add other discounted items to the weekend package. The approach may help maintain the policy of treating guests as "royalty."

A Finnish student commented that hotels in Finland provide customers who have a high volume of business in peak periods with complementary rooms in the off-peak period.

2. The customers, competitors, and cost factors that apply to setting the rates for Super Bowl weekend include:

Customers. The likely customers can be classified as:

a. long-term Galaxy hotel customers, and
b. other customers.

Charging the market rate (even if it is $300 a night) is not likely to alienate other customers. Diamond's problem lies with long-term customers. He may want to offer preferred reservations or "normal" weekday ($150/$180 a night) rates to his regular customers on Super Bowl weekend.

Competitors. Several four-star prestige hotels are already advertising $300 a night rates. Thus, Galaxy will not be viewed as the first to adopt an "aggressive price-gouging" approach.

Hotels often increase their rates because of increased demand even when costs do not increase. It is unlikely that the Galaxy chain would be singled out for negative publicity from such a policy, especially if it made an effort to give preferential bookings and rates to its regular customers.

Costs. The variable costs of servicing each room are the same as in the answer to requirement 1.

12-32 (40–45 min.) Target prices, target costs, value engineering, cost incurrence, locked-in cost, activity-based costing.

1.

	Old CE100	Cost Change	New CE100
Direct materials costs	$182,000	$2.20 × 7,000 = $15,400 less	$166,600
Direct manufacturing labor costs	28,000	$0.50 × 7,000 = $3,500 less	24,500
Machining costs	31,500	Unchanged because capacity same	31,500
Testing costs	35,000	(20% × 2.5 × 7,000) × $2 = $7,000 less	28,000
Rework costs	14,000	(See Note 1)	5,600
Ordering costs	3,360	(See Note 2)	2,100
Engineering costs	21,140	Unchanged because capacity same	21,140
Total manufacturing costs	$315,000		$279,440

Note 1:
10% of old CE100s are reworked. That is, 700 (10% of 7,000) CE100s made are reworked. Rework costs = $20 per unit reworked × 700 = $14,000. If rework falls to 4% of New CE100s manufactured, 280 (4% of 7,000) New CE100s manufactured will require rework. Rework costs = $20 per unit × 280 = $5,600.

Note 2 :
Ordering costs for New CE100 = 2 orders/month × 50 components × $21/order
= $2,100

Unit manufacturing costs of New CE100 = $279,440 ÷ 7,000 = $39.92

2. Total manufacturing cost reductions based on new design = $315,000 – $279,440
= $35,560

Reduction in unit manufacturing costs based on new design = $35,560 ÷ 7,000
= $ 5.08 per unit.

The reduction in unit manufacturing costs based on the new design can also be calculated as :
Unit cost of old design, $45 ($315,000 ÷ 7,000 units) – Unit cost of new design, $39.92 = $5.08

Hence, the target cost reduction of $6 per unit is not achieved by the redesign.

3. Changes in design have a considerably larger impact on costs per unit relative to improvements in manufacturing efficiency ($5.08 versus $1.50). One explanation is that many costs are locked in once the design of the radio-cassette is completed. Improvements in manufacturing efficiency cannot reduce many of these costs. Design choices can influence many direct and overhead cost categories, for example, by reducing direct materials requirements, by reducing defects requiring rework, and by designing in fewer components that translate into fewer orders placed and lower ordering costs.