Chapter 10
Flexible Budgets and Performance Analysis

Solutions to Questions

10-1 The planning budget is prepared for the planned level of activity. It is static because it is not adjusted even if the level of activity subsequently changes.

10-2 A flexible budget can be adjusted to reflect any level of activity—including the actual level of activity. By contrast, a static planning budget is prepared for a single level of activity and is not subsequently adjusted.

10-3 Actual results can differ from the budget for many reasons. Very broadly speaking, the differences are usually due to a change in the level of activity, changes in prices, and changes in how effectively resources are managed.

10-4 As noted above, a difference between the budget and actual results can be due to many factors. Most importantly, the level of activity can have a very big impact on costs. From a manager's perspective, a variance that is due to a change in activity is very different from a variance that is due to changes in prices and changes in how effectively resources are managed. A variance of the first kind requires very different actions from a variance of the second kind. Consequently, these two kinds of variances should be clearly separated from each other. When the budget is directly compared to the actual results, these two kinds of variances are lumped together.

10-5 An activity variance is the difference between a revenue or cost item in the static planning budget and the same item in the flexible budget. An activity variance is due solely to the difference in the level of activity assumed in the planning budget and the actual level of activity used in the flexible budget. Caution should be exercised in interpreting an activity variance. The "favorable" and "unfavorable" labels are perhaps misleading for activity variances that involve costs. A "favorable" activity variance for a cost occurs because the cost has some variable component and the actual level of activity is less than the planned level of activity. An "unfavorable" activity variance for a cost occurs because the cost has some variable component and the actual level of activity is greater than the planned level of activity.

10-6 A revenue variance is the difference between how much the revenue should have been, given the actual level of activity, and the actual revenue for the period. A revenue variance is easy to interpret. A favorable revenue variance occurs because the revenue is greater than expected for the actual level of activity. An unfavorable revenue variance occurs because the revenue is less than expected for the actual level of activity.

10-7 A spending variance is the difference between how much a cost should have been, given the actual level of activity, and the actual amount of the cost. Like the revenue variance, the interpretation of a spending variance is straight-forward. A favorable spending variance occurs because the cost is lower than expected for the actual level of activity. An unfavorable spending variance occurs because the cost is

higher than expected for the actual level of activity.

10-8 In a flexible budget performance report, the static planning budget is not directly compared to actual results. The flexible budget is interposed between the static planning budget and actual results. The differences between the static planning budget and the flexible budget are activity variances. The differences between the flexible budget and the actual results are the revenue and spending variances. The flexible budget performance report cleanly separates the differences between the static planning budget and the actual results that are due to changes in activity (the activity variances) from the differences that are due to changes in prices and the effectiveness with which resources are managed (the revenue and spending variances).

10-9 The only difference between a flexible budget based on a single cost driver and one based on two cost drivers is the cost formulas. When there are two cost drivers, some costs may be a function of the first cost driver, some costs may be a function of the second cost driver, and some costs may be a function of both cost drivers.

10-10 When the static planning budget is directly compared to actual results, it is implicitly assumed that costs (and revenues) should not change with a change in the level of activity. This assumption is valid only for fixed costs. However, it is unlikely that all costs are fixed. Some are likely to be variable or mixed.

10-11 When the static planning budget is adjusted proportionately for a change in activity and then directly compared to actual results, it is implicitly assumed that costs should change in proportion to a change in the level of activity. This assumption is valid only for strictly variable costs. However, it is unlikely that all costs are strictly variable. Some are likely to be fixed or mixed.

Exercise 10-1 (10 minutes)

Puget Sound Divers
Flexible Budget
For the Month Ended May 31

Actual diving-hours.....	105
Revenue ($365.00q).....	$38,325
Expenses:	
Wages and salaries ($8,000 + $125.00q). .	21,125
Supplies ($3.00q).....	315
Equipment rental ($1,800 + $32.00q)……	5,160
Insurance ($3,400).....	3,400
Miscellaneous ($630 + $1.80q).....	819
Total expense.....	30,819
Net operating income.....	$ 7,506

Exercise 10-2 (15 minutes)

1. The activity variances are shown below:

Flight Café
Activity Variances
For the Month Ended July 31

	Planning Budget	*Flexible Budget*	*Activity Variances*	
Meals	18,000	17,800		
Revenue ($4.50q)	$81,000	$80,100	$900	U
Expenses:				
Raw materials ($2.40q)	43,200	42,720	480	F
Wages and salaries ($5,200 + $0.30q)	10,600	10,540	60	F
Utilities ($2,400 + $0.05q)	3,300	3,290	10	F
Facility rent ($4,300)	4,300	4,300	0	
Insurance ($2,300)	2,300	2,300	0	
Miscellaneous ($680 + $0.10q)	2,480	2,460	20	F
Total expense	66,180	65,610	570	F
Net operating income	$14,820	$14,490	$330	U

2. Management should be concerned that the level of activity fell below what had been planned for the month. This led to an expected decline in profits of $330. However, the individual items on the report should not receive much management attention. The unfavorable variance for revenue and the favorable variances for expenses are entirely caused by the drop in activity.

Exercise 10-3 (15 minutes)

Quilcene Oysteria
Revenue and Spending Variances
For the Month Ended August 31

	Flexible Budget	*Actual Results*	*Revenue and Spending Variances*	
Pounds	8,000	8,000		
Revenue ($4.00q)	$32,000	$35,200	$3,200	F
Expenses:				
Packing supplies ($0.50q)	4,000	4,200	200	U
Oyster bed maintenance ($3,200)	3,200	3,100	100	F
Wages and salaries ($2,900 + $0.30q)	5,300	5,640	340	U
Shipping ($0.80q)	6,400	6,950	550	U
Utilities ($830)	830	810	20	F
Other ($450 + $0.05q)	850	980	130	U
Total expense	20,580	21,680	1,100	U
Net operating income	$11,420	$13,520	$2,100	F

Exercise 10-4 (20 minutes)

1.

Vulcan Flyovers
Flexible Budget Performance Report
For the Month Ended July 31

	Planning Budget	*Activity Variances*		*Flexible Budget*	*Revenue and Spending Variances*		*Actual Results*
Flights (q).....	50			48			48
Revenue ($320.00q).....	$16,000	$640	U	$15,360	$1,710	U	$13,650
Expenses:							
Wages and salaries ($4,000 + $82.00q).....	8,100	164	F	7,936	494	U	8,430
Fuel ($23.00q).....	1,150	46	F	1,104	156	U	1,260
Airport fees ($650 + $38.00q).....	2,550	76	F	2,474	124	F	2,350
Aircraft depreciation ($7.00q).....	350	14	F	336	0		336
Office expenses ($190 + $2.00q). .	290	4	F	286	174	U	460
Total expense.....	12,440	304	F	12,136	700	U	12,836
Net operating income.....	$ 3,560	$336	U	$ 3,224	$2,410	U	$ 814

2. The overall $336 unfavorable activity variance is due to activity falling below what had been planned for the month. The $1,710 unfavorable revenue variance is very large relative to the company's net operating income and should be investigated. Was this due to discounts given or perhaps a lower average number of passengers per flight than usual? The $494 unfavorable spending variance for wages and salaries is also large and should be investigated. The other spending variances are relatively small, but are worth some management attention—particularly if they recur next month.

Exercise 10-5 (15 minutes)

Alyeski Tours
Planning Budget
For the Month Ended July 31

Budgeted cruises (q_1)	24
Budgeted passengers (q_2)	1,400
Revenue (25.00q_2$)	$35,000
Expenses:	
Vessel operating costs ($5,200 + 480.00q_1$ +2.00q_2$)	19,520
Advertising ($1,700)	1,700
Administrative costs ($4,300 + 24.00q_1$ +1.00q_2$)	6,276
Insurance ($2,900)	2,900
Total expense	30,396
Net operating income	$ 4,604

Exercise 10-6 (10 minutes)

The variance report compares the planning budget to actual results and should *not* be used to evaluate how well costs were controlled during April. The planning budget is based on 100 jobs, but the actual results are for 105 jobs. Consequently, the actual revenues and many of the actual costs *should* have been different from what was budgeted at the beginning of the period. Direct comparisons of budgeted to actual costs are valid only if the costs are fixed.

To evaluate how well revenues and costs were controlled, it is necessary to estimate what the revenues and costs should have been for the actual level of activity using a flexible budget. The flexible budget amounts can then be compared to the actual results to evaluate how well revenues and costs were controlled.

Exercise 10-7 (15 minutes)

The adjusted budget was created by multiplying each item in the budget by the ratio 105/100; in other words, each item was adjusted upward by 5%. This procedure provides valid benchmarks for revenues and for costs that are strictly variable, but overstates what fixed and mixed costs should be. Fixed costs, for example, should not increase at all if the activity level increases by 5%—providing, of course, that this level of activity is within the relevant range. Mixed costs should increase less than 5%.

To evaluate how well revenues and costs were controlled, it is necessary to estimate what the revenues and costs should have been for the actual level of activity using a flexible budget that explicitly recognizes fixed and mixed costs. The flexible budget amounts can then be compared to the actual results to evaluate how well revenues and costs were controlled.

Exercise 10-8 (15 minutes)

Lavage Rapide
Planning Budget
For the Month Ended August 31

Budgeted cars washed (q).....	9,000
Revenue ($4.90q).....	$44,100
Expenses:	
Cleaning supplies ($0.80q).....	7,200
Electricity ($1,200 + $0.15q).....	2,550
Maintenance ($0.20q).....	1,800
Wages and salaries ($5,000 + $0.30q).....	7,700
Depreciation ($6,000).....	6,000
Rent ($8,000).....	8,000
Administrative expenses ($4,000 + $0.10q).	4,900
Total expense.....	38,150
Net operating income.....	$ 5,950

Exercise 10-9 (15 minutes)

Lavage Rapide
Flexible Budget
For the Month Ended August 31

Actual cars washed (q)	8,800
Revenue ($4.90q)	$43,120
Expenses:	
Cleaning supplies ($0.80q)	7,040
Electricity ($1,200 + $0.15q)	2,520
Maintenance ($0.20q)	1,760
Wages and salaries ($5,000 + $0.30q)	7,640
Depreciation ($6,000)	6,000
Rent ($8,000)	8,000
Administrative expenses ($4,000 + $0.10q)	4,880
Total expense	37,840
Net operating income	$ 5,280

Exercise 10-10 (20 minutes)

Lavage Rapide
Activity Variances
For the Month Ended August 31

	Planning Budget	*Flexible Budget*	*Activity Variances*	
Cars washed (q)	9,000	8,800		
Revenue ($4.90q)	$44,100	$43,120	$980	U
Expenses:				
Cleaning supplies ($0.80q)	7,200	7,040	160	F
Electricity ($1,200 + $0.15q)	2,550	2,520	30	F
Maintenance ($0.20q)	1,800	1,760	40	F
Wages and salaries ($5,000 + $0.30q)	7,700	7,640	60	F
Depreciation ($6,000)	6,000	6,000	0	
Rent ($8,000)	8,000	8,000	0	
Administrative expenses ($4,000 + $0.10q)	4,900	4,880	20	F
Total expense	38,150	37,840	310	F
Net operating income	$ 5,950	$ 5,280	$670	U

Exercise 10-11 (20 minutes)

Lavage Rapide
Revenue and Spending Variances
For the Month Ended August 31

	Flexible Budget	*Actual Results*	*Revenue and Spending Variances*	
Cars washed (q).....	8,800	8,800		
Revenue ($4.90q).....	$43,120	$43,080	$ 40	U
Expenses:				
Cleaning supplies ($0.80q).....	7,040	7,560	520	U
Electricity ($1,200 + $0.15q).....	2,520	2,670	150	U
Maintenance ($0.20q).....	1,760	2,260	500	U
Wages and salaries ($5,000 + $0.30q).....	7,640	8,500	860	U
Depreciation ($6,000).....	6,000	6,000	0	
Rent ($8,000).....	8,000	8,000	0	
Administrative expenses ($4,000 + $0.10q).....	4,880	4,950	70	U
Total expense.....	37,840	39,940	2,100	U
Net operating income.....	$ 5,280	$ 3,140	$2,140	U

Exercise 10-12 (30 minutes)

Lavage Rapide
Flexible Budget Performance Report
For the Month Ended August 31

	Planning Budget	*Activity Variances*		*Flexible Budget*	*Revenue and Spending Variances*		*Actual Results*
Cars washed (q)	9,000			8,800			8,800
Revenue ($4.90q)	$44,100	$980	U	$43,120	$ 40	U	$43,080
Expenses:							
Cleaning supplies ($0.80q)	7,200	160	F	7,040	520	U	7,560
Electricity ($1,200 + $0.15q)	2,550	30	F	2,520	150	U	2,670
Maintenance ($0.20q)	1,800	40	F	1,760	500	U	2,260
Wages and salaries ($5,000 + $0.30q)	7,700	60	F	7,640	860	U	8,500
Depreciation ($6,000)	6,000	0		6,000	0		6,000
Rent ($8,000)	8,000	0		8,000	0		8,000
Administrative expenses ($4,000 + $0.10q)	4,900	20	F	4,880	70	U	4,950
Total expense	38,150	310	F	37,840	2,100	U	39,940
Net operating income	$ 5,950	$670	U	$ 5,280	$2,140	U	$ 3,140

Exercise 10-13 (10 minutes)

Wyckam Manufacturing Inc.
Planning Budget for Manufacturing Costs
For the Month Ended June 30

Budgeted machine-hours (q).....	5,000
Direct materials ($4.25q).....	$21,250
Direct labor ($36,800).....	36,800
Supplies ($0.30q).....	1,500
Utilities ($1,400 + $0.05q).....	1,650
Depreciation ($16,700).....	16,700
Insurance ($12,700).....	12,700
Total manufacturing cost.....	$90,600

Exercise 10-14 (20 minutes)

Jake's Roof Repair
Activity Variances
For the Month Ended May 31

	Planning Budget	*Flexible Budget*	*Activity Variances*	
Repair-hours (q).....	2,800	2,900		
Revenue ($44.50q).....	$124,600	$129,050	$4,450	F
Expenses:				
Wages and salaries ($23,200 + $16.30q).....	68,840	70,470	1,630	U
Parts and supplies ($8.60q).....	24,080	24,940	860	U
Equipment depreciation ($1,600 + $0.40q).....	2,720	2,760	40	U
Truck operating expenses ($6,400 + $1.70q).....	11,160	11,330	170	U
Rent ($3,480).....	3,480	3,480	0	
Administrative expenses ($4,500 + $0.80q).....	6,740	6,820	80	U
Total expense.....	117,020	119,800	2,780	U
Net operating income.....	$ 7,580	$ 9,250	$1,670	F

Exercise 10-15 (20 minutes)

Via Gelato
Revenue and Spending Variances
For the Month Ended June 30

	Flexible Budget	*Actual Results*	*Revenue and Spending Variances*	
Liters (q).....	6,200	6,200		
Revenue ($12.00q).....	$74,400	$71,540	$2,860	U
Expenses:				
Raw materials ($4.65q).....	28,830	29,230	400	U
Wages ($5,600 + $1.40q).....	14,280	13,860	420	F
Utilities ($1,630 + $0.20q).....	2,870	3,270	400	U
Rent ($2,600).....	2,600	2,600	0	
Insurance ($1,350).....	1,350	1,350	0	
Miscellaneous ($650 + $0.35q)..	2,820	2,590	230	F
Total expense.....	52,750	52,900	150	U
Net operating income.....	$21,650	$18,640	$3,010	U

Exercise 10-16 (30 minutes)

AirQual Test Corporation
Flexible Budget Performance Report
For the Month Ended February 28

	Planning Budget	*Activity Variances*		*Flexible Budget*	*Revenue and Spending Variances*		*Actual Results*
Jobs (q)	50			52			52
Revenue ($360.00q)	$18,000	$720	F	$18,720	$230	F	$18,950
Expenses:							
Technician wages ($6,400)	6,400	0		6,400	50	U	6,450
Mobile lab operating expenses ($2,900 + $35.00q)	4,650	70	U	4,720	190	F	4,530
Office expenses ($2,600 + $2.00q)	2,700	4	U	2,704	346	U	3,050
Advertising expenses ($970)	970	0		970	25	U	995
Insurance ($1,680)	1,680	0		1,680	0		1,680
Miscellaneous expenses ($500 + $3.00q)	650	6	U	656	191	F	465
Total expense	17,050	80	U	17,130	40	U	17,170
Net operating income	$ 950	$640	F	$ 1,590	$190	F	$ 1,780

Exercise 10-17 (45 minutes)

1. The planning budget based on 3 courses and 45 students appears below:

Gourmand Cooking School
Planning Budget
For the Month Ended September 30

Budgeted courses (q_1)	3
Budgeted students (q_2)	45
Revenue (800q_2$)	$36,000
Expenses:	
Instructor wages ($3,080$q_1$)	9,240
Classroom supplies (260q_2$)	11,700
Utilities ($870 + 130q_1$)	1,260
Campus rent ($4,200)	4,200
Insurance ($1,890)	1,890
Administrative expenses ($3,270 + 15q_1$ +4q_2$)	3,495
Total expense	31,785
Net operating income	$ 4,215

2. The flexible budget based on 3 courses and 42 students appears below:

Gourmand Cooking School
Flexible Budget
For the Month Ended September 30

Actual courses (q_1)	3
Actual students (q_2)	42
Revenue (800q_2$)	$33,600
Expenses:	
Instructor wages ($3,080$q_1$)	9,240
Classroom supplies (260q_2$)	10,920
Utilities ($870 + 130q_1$)	1,260
Campus rent ($4,200)	4,200
Insurance ($1,890)	1,890
Administrative expenses ($3,270 + 15q_1$ +4q_2$)	3,483
Total expense	30,993
Net operating income	$ 2,607

Exercise 10-17 (continued)

3. The flexible budget performance report for September appears below:

Gourmand Cooking School
Flexible Budget Performance Report
For the Month Ended September 30

	Planning Budget	*Activity Variances*		*Flexible Budget*	*Revenue and Spending Variances*		*Actual Results*
Courses (q1)	3			3			3
Students (q2)	45			42			42
Revenue ($800q2)	$36,000	$2,400	U	$33,600	$1,200	U	$32,400
Expenses:							
Instructor wages ($3,080q1)	9,240	0		9,240	160	F	9,080
Classroom supplies ($260q2)	11,700	780	F	10,920	2,380	F	8,540
Utilities ($870 + $130q1)	1,260	0		1,260	270	U	1,530
Campus rent ($4,200)	4,200	0		4,200	0		4,200
Insurance ($1,890)	1,890	0		1,890	0		1,890
Administrative expenses ($3,270 + $15q1 +$4q2)	3,495	12	F	3,483	307	U	3,790
Total expense	31,785	792	F	30,993	1,963	F	29,030
Net operating income	$ 4,215	$1,608	U	$ 2,607	$ 763	F	$ 3,370

Exercise 10-18 (45 minutes)

1. The planning budget appears below. Note that the report does not include revenue or net operating income because the production department is a cost center that does not have any revenue.

Packaging Solutions Corporation
Production Department Planning Budget
For the Month Ended March 31

Budgeted labor-hours (q).....	8,000
Direct labor ($15.80q).....	$126,400
Indirect labor ($8,200 + $1.60q).....	21,000
Utilities ($6,400 + $0.80q).....	12,800
Supplies ($1,100 + $0.40q).....	4,300
Equipment depreciation ($23,000 + $3.70q)..	52,600
Factory rent ($8,400).....	8,400
Property taxes ($2,100).....	2,100
Factory administration ($11,700 + $1.90q)….	26,900
Total expense.....	$254,500

2. The flexible budget appears below. Like the planning budget, this report does not include revenue or net operating income because the production department is a cost center that does not have any revenue.

Packaging Solutions Corporation
Production Department Flexible Budget
For the Month Ended March 31

Actual labor-hours (q).....	8,400
Direct labor ($15.80q).....	$132,720
Indirect labor ($8,200 + $1.60q).....	21,640
Utilities ($6,400 + $0.80q).....	13,120
Supplies ($1,100 + $0.40q).....	4,460
Equipment depreciation ($23,000 + $3.70q)..	54,080
Factory rent ($8,400).....	8,400
Property taxes ($2,100).....	2,100
Factory administration ($11,700 + $1.90q)….	27,660
Total expense.....	$264,180

Exercise 10-18 (continued)

3. The flexible budget performance report appears below. This report does not include revenue or net operating income because the production department is a cost center that does not have any revenue.

Packaging Solutions Corporation
Production Department Flexible Budget Performance Report
For the Month Ended March 31

	Planning Budget	*Activity Variances*		*Flexible Budget*	*Spending Variances*		*Actual Results*
Labor-hours (q)	8,000			8,400			8,400
Direct labor ($15.80q)	$126,400	$6,320	U	$132,720	$2,010	U	$134,730
Indirect labor ($8,200 + $1.60q)	21,000	640	U	21,640	1,780	F	19,860
Utilities ($6,400 + $0.80q)	12,800	320	U	13,120	1,450	U	14,570
Supplies ($1,100 + $0.40q)	4,300	160	U	4,460	520	U	4,980
Equipment depreciation ($23,000 + $3.70q)	52,600	1,480	U	54,080	0		54,080
Factory rent ($8,400)	8,400	0		8,400	300	U	8,700
Property taxes ($2,100)	2,100	0		2,100	0		2,100
Factory administration ($11,700 + $1.90q)	26,900	760	U	27,660	1,190	F	26,470
Total expense	$254,500	$9,680	U	$264,180	$1,310	U	$265,490

Exercise 10-18 (continued)

4. The overall unfavorable activity variance of $9,680 occurred because the actual level of activity exceeded the budgeted level of activity. The production manager certainly should not be held responsible for this unfavorable variance if this increased activity was due to more orders or more sales. On the other hand, the overall unfavorable spending variance of $1,310 may be of concern to management. Why did the unfavorable—and favorable—variances occur? Even the relatively small unfavorable spending variance for supplies of $520 should probably be investigated because, as a percentage of what the cost should have been ($520/$4,460 = 11.7%), this variance is fairly large.

Problem 10-19 (45 minutes)

1. The variance report should *not* be used to evaluate how well costs were controlled. In July, the planning budget was based on 150 lessons, but the actual results are for 155 lessons—an increase of more than 3% over budget. Consequently, the actual revenues and many of the actual costs *should* have been different from what was budgeted at the beginning of the period. For example, instructor wages, a variable cost, should have increased by more than 3% because of the increase in activity, but the variance report assumes that they should not have increased at all. This results in a spurious unfavorable variance for instructor wages. Direct comparisons of budgeted to actual costs are valid only if the costs are fixed.

2. See the following page.

3. The overall activity variance for net operating income was $435 F (favorable). That means that as a consequence of the increase in activity from 150 lessons to 155 lessons, the net operating income should have been up $435 over budget. However, it wasn't. The budgeted net operating income was $8,030 and the actual net operating income was $8,080, so the profit was up by only $50—not $435 as it should have been. There are many reasons for this—as shown in the revenue and spending variances. Perhaps most importantly, fuel costs were much higher than expected. The spending variance for fuel was $425 U (unfavorable) and may have been due to an increase in the price of fuel that is beyond the owner/manager's control. Most of the other spending variances were favorable, so with the exception of this item, costs seem to have been adequately controlled. In addition, the unfavorable revenue variance of $200 indicates that revenue was slightly less than they should have been. This variance is very small relative to the size of the revenue, so it may not justify investigation.

Problem 10-19 (continued)

TipTop Flight School
Flexible Budget Performance Report
For the Month Ended July 31

	Planning Budget	*Activity Variances*		*Flexible Budget*	*Revenue and Spending Variances*		*Actual Results*
Lessons (q)	150			155			155
Revenue ($220q)	$33,000	$1,100	F	$34,100	$200	U	$33,900
Expenses:							
Instructor wages ($65q)	9,750	325	U	10,075	205	F	9,870
Aircraft depreciation ($38q)	5,700	190	U	5,890	0		5,890
Fuel ($15q)	2,250	75	U	2,325	425	U	2,750
Maintenance ($530 + $12q)	2,330	60	U	2,390	60	U	2,450
Ground facility expenses ($1,250 + $2q)	1,550	10	U	1,560	20	F	1,540
Administration ($3,240 + $1q)	3,390	5	U	3,395	75	F	3,320
Total expense	24,970	665	U	25,635	185	U	25,820
Net operating income	$ 8,030	$ 435	F	$ 8,465	$385	U	$ 8,080

Problem 10-20 (30 minutes)

1. Performance should be evaluated using a flexible budget performance report. In this case, the report will not include revenues (shown in East Caribbean dollars).

St. Lucia Blood Bank
Flexible Budget Performance Report
For the Month Ended September 30

	Planning Budget	*Activity Variances*		*Flexible Budget*	*Spending Variances*		*Actual Results*
Liters of blood collected (q).....	500			620			620
Medical supplies ($15.00q).....	$ 7,500	$1,800	U	$ 9,300	$ 50	F	$ 9,250
Lab tests ($12.00q).....	6,000	1,440	U	7,440	1,260	F	6,180
Equipment depreciation ($2,500).....	2,500	0		2,500	300	U	2,800
Rent ($1,000).....	1,000	0		1,000	0		1,000
Utilities ($500).....	500	0		500	70	U	570
Administration ($10,000 + $2.50q).....	11,250	300	U	11,550	190	U	11,740
Total expense.....	$28,750	$3,540	U	$32,290	$ 750	F	$31,540

2. The overall unfavorable activity variance of $3,540 was caused by the 24% increase in activity. There is no reason to investigate this particular variance. The overall spending variance is $750 F, which would seem to indicate that costs were well-controlled. However, the favorable $1,260 spending variance for lab tests is curious. The fact that this variance is favorable indicates that less was spent on lab tests than should have been spent according to the cost formula. Why? Did the blood bank get a substantial discount on the lab tests? Did the blood bank fail to perform required lab tests? If so, was this wise? In addition, the unfavorable spending variance of $300 for equipment depreciation requires some explanation. Was more equipment obtained to collect the additional blood?

Problem 10-21 (45 minutes)

1. The cost reports are of little use for assessing how well costs were controlled. The problem is that the company is comparing budgeted costs at one level of activity to actual costs at another level of activity. Costs that are variable will naturally be different at these two different levels of activity. Although the cost reports do a good job of showing whether fixed costs were controlled, they do not do a good job of showing whether variable costs were controlled. Since sales have chronically failed to meet budget, the level of activity in the factory is also likely to have chronically been below budget. Consequently, the variances for variable costs have likely been favorable simply because activity has been less than budgeted in the production departments. No wonder the production supervisors have been pleased with the reports.

2. The company should use a flexible budget approach to evaluate cost control. Under the flexible budget approach, the actual costs incurred in working 35,000 machine-hours are compared to what the costs should have been for that level of activity.

3. See the following page.

4. The flexible budget performance report provides a much clearer picture of the performance of the Assembly Department than the original cost control report prepared by the company. The overall activity variance is $13,500 F (favorable) which simply reflects the fact that the actual level of activity was significantly less than the budgeted level of activity. The variable costs would naturally be less than budgeted.

   The spending variances indicate that costs were *not* controlled by the Assembly Department. All three of the variable costs have large unfavorable spending variances and those variances are significantly larger than the one favorable spending variance on the report.

Problem 10-21 (continued)

3.

Assembly Department
Flexible Budget Performance Report
For the Month Ended March 31

	Planning Budget	*Activity Variances*		*Flexible Budget*	*Spending Variances*		*Actual Results*
Machine-hours (q).....	40,000			35,000			35,000
Supplies ($0.80q)*.....	$ 32,000	$ 4,000	F	$ 28,000	$1,700	U	$ 29,700
Scrap ($0.50q)*.....	20,000	2,500	F	17,500	2,000	U	19,500
Indirect materials ($1.40q)*.....	56,000	7,000	F	49,000	2,800	U	51,800
Wages and salaries ($80,000).....	80,000	0		80,000	800	F	79,200
Equipment depreciation ($60,000)...	60,000	0		60,000	0		60,000
Total.....	$248,000	$13,500	F	$234,500	$5,700	U	$240,200

*The variable cost per machine-hour is obtained by dividing the total variable cost from the planning budget by 30,000 machine-hours.

Problem 10-22 (30 minutes)

1.

Milano Pizza
Flexible Budget Performance Report
For the Month Ended November 30

	Planning Budget	*Activity Variances*		*Flexible Budget*	*Spending Variances*		*Actual Results*
Pizzas (q_1)	1,200			1,240			1,240
Deliveries (q_2)	180			174			174
Revenue (13.50q_1$)	$16,200	$540	F	$16,740	$680	F	$17,420
Expenses:							
Pizza ingredients (3.80q_1$)	4,560	152	U	4,712	273	U	4,985
Kitchen staff ($5,220)	5,220	0		5,220	61	U	5,281
Utilities ($630 + 0.05q_1$)	690	2	U	692	292	U	984
Delivery person (3.50q_2$)	630	21	F	609	0		609
Delivery vehicle ($540 + 1.50q_2$)	810	9	F	801	146	F	655
Equipment depreciation ($275)	275	0		275	0		275
Rent ($1,830)	1,830	0		1,830	0		1,830
Miscellaneous ($820 + 0.15q_1$)	1,000	6	U	1,006	52	F	954
Total expense	15,015	130	U	15,145	428	U	15,573
Net operating income	$ 1,185	$410	F	$ 1,595	$252	F	$ 1,847

Problem 10-22 (continued)

2. Some of the activity variances are favorable and some are unfavorable. This occurs because there are two cost drivers (i.e., measures of activity) and one is up while the other is down. The actual number of pizzas delivered is greater than budgeted, so the activity variance for revenue is favorable, but the activity variances for pizza ingredients, utilities, and miscellaneous are unfavorable. In contrast, the actual number of deliveries is less than budgeted, so the activity variances for the delivery person and the delivery vehicle are favorable.

Problem 10-24 (45 minutes)

1. The cost control report compares the planning budget, which was prepared for 35,000 machine-hours, to actual results for 38,000 machine-hours. This is like comparing apples to oranges. Costs that are variable or mixed *should* be higher when the activity level is 38,000 rather than 35,000 machine-hours. Direct comparisons of budgeted to actual costs are valid only if the costs are fixed. The cost control report prepared by the company should *not* be used to evaluate how well costs were controlled.

Problem 10-24 (continued)

2. A report that would be helpful in assessing how well costs were controlled appears below:

Freemont Corporation—Machining Department
Flexible Budget Performance Report
For the Month Ended June 30

	Planning Budget	*Activity Variances*		*Flexible Budget*	*Spending Variances*		*Actual Results*
Machine-hours (q).....	35,000			38,000			38,000
Direct labor wages ($2.30q).....	$ 80,500	$ 6,900	U	$ 87,400	$1,300	F	$ 86,100
Supplies ($0.60q).....	21,000	1,800	U	22,800	300	U	23,100
Maintenance ($92,000 + $1.20q)..	134,000	3,600	U	137,600	300	F	137,300
Utilities ($11,700 + $0.10q).....	15,200	300	U	15,500	200	U	15,700
Supervision ($38,000).....	38,000	0		38,000	0		38,000
Depreciation ($80,000).....	80,000	0		80,000	0		80,000
Total.....	$368,700	$12,600	U	$381,300	$1,100	F	$380,200

Note that in this new report the overall spending variance is favorable—indicating that costs were most likely under control.

Problem 10-25 (45 minutes)

1. The report prepared by the bookkeeper compares average budgeted per unit revenues and costs to average actual per unit revenues and costs. This approach implicitly assumes that all costs are strictly variable; only variable costs should be constant on a per unit basis. The average fixed cost should decrease as the level of activity increases and should increase as the level of activity decreases. In this case, the actual level of activity was greater than the budgeted level of activity. As a consequence, the average cost per unit for any cost that is fixed or mixed (such as office expenses, equipment depreciation, rent, and insurance) *should* decline and show a favorable variance. This makes it difficult to interpret the variance for a mixed or fixed cost. For example, was the favorable $9 variance per exchange for rent due simply to the increased volume or did the company actually save any money on its rent? Because of this ambiguity, the report prepared by the bookkeeper is not as useful as a performance report prepared using a flexible budget.

2. A flexible budget performance report would be much more helpful in assessing the performance of the company than the report prepared by the bookkeeper. To construct such a report, we first need to determine the cost formulas as follows, where q is the number of exchanges completed:

Revenue.....	$395q	The revenue all comes from fees.
Legal and search fees.....	$165q	Variable cost
Office expenses.....	$5,200 + $5q	$5,200 is fixed; $5 = ($135 × 40 − $5,200)/40
Equipment depreciation…	$400	$400 = $10 × 40
Rent.....	$1,800	$1,800 = $45 × 40
Insurance.....	$200	$200 = $5 × 40

Problem 10-25 (continued)

Exchange Corp
Flexible Budget Performance Report
For the Month Ended May 31

	Planning Budget	*Activity Variances*		*Flexible Budget*	*Spending Variances*		*Actual Results*
Exchanges completed (q).....	40			50			50
Revenue ($395q).....	$15,800	$3,950	F	$19,750	$ 500	U	$19,250
Expenses:							
Legal and search fees ($165q). .	6,600	1,650	U	8,250	950	U	9,200
Office expenses ($5,200 + $5q).....	5,400	50	U	5,450	150	U	5,600
Equipment depreciation ($400)..	400	0		400	0		400
Rent ($1,800).....	1,800	0		1,800	0		1,800
Insurance ($200).....	200	0		200	0		200
Total expense.....	14,400	1,700	U	16,100	1,100	U	17,200
Net operating income.....	$ 1,400	$2,250	F	$ 3,650	$1,600	U	$ 2,050

3. On the one hand, the increase in the number of exchanges completed was positive. The overall favorable activity of $2,250 indicates that the net operating income should have increased by that amount because of the increase in activity. However, the net operating income did not actually increase by nearly that much. This was due to the unfavorable revenue variance and a number of unfavorable spending variances, all of which should be investigated by the owner.

Case 10-26 (75 minutes)

1. The cost formulas for The Little Theatre appear below, where q_1 is the number of productions and q_2 is the number of performances:
   - Actors' and directors' wages: $\$2{,}000q_2$. Variable with respect to the number of performances. \$2,000 = \$216,000 ÷ 108.
   - Stagehands' wages: $\$300q_2$. Variable with respect to the number of performances. \$300 = \$32,400 ÷ 108.
   - Ticket booth personnel and ushers' wages: $\$150q_2$. Variable with respect to the number of performances. \$150 = \$16,200 ÷ 108.
   - Scenery, costumes, and props: $\$18{,}000q_1$. Variable with respect to the number of productions. \$18,000 = \$108,000 ÷ 6.
   - Theater hall rent: $\$500q_2$. Variable with respect to the number of performances. \$500 = \$54,000 ÷ 108.
   - Printed programs: $\$250q_2$. Variable with respect to the number of performances. \$250 = \$27,000 ÷ 108.
   - Publicity: $\$2{,}000q_1$. Variable with respect to the number of productions. \$2,000 = \$12,000 ÷ 6.
   - Administrative expenses: $\$32{,}400 + \$1{,}080q_1 + \$40q_2$.
     - \$32,400 = 0.75 × \$43,200
     - \$1,080 = (0.15 × \$43,200) ÷ 6
     - \$40 = (0.10 × \$43,200) ÷ 108

The Little Theatre
Flexible Budget
For the Year Ended December 31

Actual number of productions (q_1)	7
Actual number of performances (q_2)	168
Actors' and directors' wages ($\$2{,}000q_2$)	\$336,000
Stagehands' wages ($\$300q_2$)	50,400
Ticket booth personnel and ushers' wages ($\$150q_2$)	25,200
Scenery, costumes, and props ($\$18{,}000q_1$)	126,000
Theater hall rent ($\$500q_2$)	84,000
Printed programs ($\$250q_2$)	42,000
Publicity ($\$2{,}000q_1$)	14,000
Administrative expenses ($\$32{,}400 + \$1{,}080q_1 + \$40q_2$)	46,680
Total expense	\$724,280

Case 10-26 (continued)

2. The flexible budget performance report follows:

The Little Theatre
Flexible Budget Performance Report
For the Year Ended December 31

	Planning Budget	*Activity Variances*		*Flexible Budget*	*Spending Variances*		*Actual Results*
Number of productions (q_1).....	6			7			7
Number of performances (q_2).....	108			168			168
Actors' and directors' wages ($2,000$q_2$).....	$216,000	$120,000	U	$336,000	$5,800	U	$341,800
Stagehands' wages (300q_2$).....	32,400	18,000	U	50,400	700	F	49,700
Ticket booth personnel and ushers' wages (150q_2$).....	16,200	9,000	U	25,200	700	U	25,900
Scenery, costumes, and props ($18,000$q_1$).....	108,000	18,000	U	126,000	4,600	U	130,600
Theater hall rent (500q_2$).....	54,000	30,000	U	84,000	6,000	F	78,000
Printed programs (250q_2$).....	27,000	15,000	U	42,000	3,700	F	38,300
Publicity ($2,000$q_1$).....	12,000	2,000	U	14,000	1,100	U	15,100
Administrative expenses ($32,400 + $1,080$q_1$ +40q_2$)....	43,200	3,480	U	46,680	820	U	47,500
Total expense.....	$508,800	$215,480	U	$724,280	$2,620	U	$726,900

Case 10-26 (continued)

3. The overall unfavorable spending variance is a very small percentage of the total cost, less than 0.4%. This suggests that costs are under control. In addition, the pattern of the variances may reflect good management. The largest unfavorable variances are for value-added activities (scenery, costumes, props, actors and directors) that may warrant additional spending. These unfavorable variances are offset by favorable variances for theater hall rent and the printed programs. Assuming that the quality of the printed programs has not noticeably declined and that the favorable variance for the rent reflects a lower negotiated rental fee, management should be congratulated. They have saved in some areas and have apparently transferred the funds to other areas that may favorably impact the quality of the theater's productions.

4. Average costs may not be very good indicators of the additional costs of any particular production or performance. The averages gloss over considerable variations in costs. For example, a production of Peter Rabbit may require only half a dozen actors and actresses and fairly simple costumes and props. On the other hand, a production of Cinderella may require dozens of actors and actresses and very elaborate and costly costumes and props. Consequently, both the production costs and the cost per performance will be much higher for Cinderella than for Peter Rabbit. Managers of theater companies know that they must estimate the costs of each new production individually—the average costs are of little use for this purpose.

Case 10-27 (30 minutes)

It is difficult to imagine how Tom Kemper could ethically agree to go along with reporting the favorable $21,000 variance for industrial engineering on the final report, even if the bill were not actually received by the end of the year. It would be misleading to exclude part of the final cost of the contract. Collaborating in this attempt to mislead corporate headquarters violates the credibility standard in the Statement of Ethical Professional Practice promulgated by the Institute of Management Accountants. The credibility standard requires that management accountants "disclose all relevant information that could reasonably be expected to influence an intended user's understanding of the reports, analyses, or recommendations." Failing to disclose the entire amount owed on the industrial engineering contract violates this standard.

Individuals will differ in how they think Kemper should handle this situation. In our opinion, he should firmly state that he is willing to call Laura, but even if the bill does not arrive, he is ethically bound to properly accrue the expenses on the report—which will mean an unfavorable variance for industrial engineering and an overall unfavorable variance. This would require a great deal of personal courage. If the general manager insists on keeping the misleading $21,000 favorable variance on the report, Kemper would have little choice except to take the dispute to the next higher managerial level in the company.

It is important to note that the problem may be a consequence of inappropriate use of performance reports by corporate headquarters. If the performance report is being used as a way of "beating up" managers, corporate headquarters may be creating a climate in which managers such as the general manager at the Wichita plant will feel like they must always turn in positive reports. This creates pressure to bend the truth since reality isn't always positive.

Case 10-28 (45 minutes)

1. The flexible budget can be prepared using the following cost formulas:
   - Gasoline: $0.15 per mile. Given.
   - Oil, minor repairs, parts: $0.04 per mile. Given.
   - Outside repairs: $75 per auto per month. $75 = $900/12
   - Insurance: $100 per auto per month. $100 = $1,200/12
   - Salaries and benefits: $7,540 per month. Given.
   - Vehicle depreciation: $250 per auto per month. $250 = $3,000/12

Boyne University Motor Pool
Spending Variances
For the Month Ended March 31

	Flexible Budget	*Actual Results*	*Spending Variances*	
Miles (q_1).....	63,000	63,000		
Autos (q_2).....	21	21		
Gasoline (0.15q_1$).....	$ 9,450	$ 9,350	$100	F
Oil, minor repairs, parts (0.04q_1$).....	2,520	2,360	160	F
Outside repairs (75q_2$).....	1,575	1,420	155	F
Insurance (100q_2$).....	2,100	2,120	20	U
Salaries and benefits ($7,540).....	7,540	7,540	0	
Vehicle depreciation (250q_2$).....	5,250	5,250	0	
Total.....	$28,435	$28,040	$395	F

2. The original report is based on a static budget approach that does not allow for variations in the number of miles driven from month to month, or for variations in the number of automobiles used. As a result, the "monthly budget" figures are unrealistic benchmarks. For example, actual variable costs such as gasoline can't be compared to the "budgeted" cost, because the monthly budget is based on only 50,000 miles rather than the 63,000 miles actually driven during the month.

   The performance report in part (1) above is more realistic because the flexible budget benchmark is based on the actual miles driven and on the actual number of automobiles used during the month.