TRAVEL COSTS: DIFFERENT PERSPECTIVES

A perspective is a point of view. A city looks quite different from the window of a bus than from an airplane. Similarly, the cost of a restaurant meal appears different, depending on whether you are the person having dinner or the one who owns the restaurant. In this lesson we will consider, from different perspectives, some of the costs of vacationing.

Ever since her parents were divorced, Sylvia has helped her mother with the cooking and cleaning at home. Consequently she and her mother really enjoy a vacation when they can eat out and let someone else wash the dishes. They also like camping out. There is a great feeling of freedom and relaxation that comes from being out of doors all day long.

Sylvia's mother has another reason for traveling. She is a travel agent and needs first-hand information about some of the accommodations and attractions that she recommends to her clients. She and Sylvia watch their costs very closely, both for themselves and also so that they can tell clients of the travel agency how to budget for a trip.

OBJECTIVES: *In this lesson, we will help Sylvia and her mother to:*

● *Compare and calculate the costs of food and lodging.*
● *Prepare a vacation budget.*
● *Compute costs for tour vacations.*

MAKING CHOICES ON A BUDGET

Sylvia and her mother have discovered that no one who travels likes expensive surprises. For example, many people do not mind paying a little extra for a good meal or accommodations with special features. But they want to know in advance what to expect. For that reason, Sylvia helps her mother prepare a detailed budget before a trip, and they also make reservations to be sure that they will not be disappointed. A **reservation** is an establishment's assurance that a motel room or a table in a restaurant will be held for you at a particular date or time. Sometimes you must use your credit card to guarantee a reservation. Even campgrounds accept reservations, and with so many people now using these facilities it is important to reserve a spot.

When Sylvia and her mother go camping or stay in a cabin with kitchen facilities, they purchase groceries and cook some meals for themselves. However, they prefer restaurants and have become skilled in predicting the prices of meals. They set up budgets for people with different tastes and means so that Sylvia's mother can make recommendations. They are always collecting brochures about restaurants and points of interest.

Everyone who travels says, "What shall we do today?" Sylvia has learned that the costs of entertainment vary greatly. Walking in the woods is free; the fee to enter a zoo or museum is usually reasonable; a special evening tour can be costly. Going to the beach is much cheaper than skiing. Gifts and souvenirs are always fun to buy, but once again, the costs can add up. Sylvia's mother says that they must stick to their budget and be careful to avoid impulse buying.

Ask Yourself

1. How can you plan your lodging expenses when you travel?

2. How can you save money on food costs when you travel?

3. What are several less expensive forms of entertainment that you enjoy?

ALGEBRA *REVIEW*

For numbers x, y, and z,

1. If $x = 10.50$ and $y = 11.90$, find the average of x and y.

2. If $x = 13.20$ and the average of x and y is 15.00, find y.

3. If $x = 8.76$, $y = 9.49$, and $z = 11.75$, find the average of x, y, and z.

4. If $x = 45.60$, $y = 58.20$, and the average of x, y, and z is 51.42, find z.

5. If $a = b + 1$ and $b = c + 1$, find the average of a, b, and c.

Graph each system of equations and find the coordinates of the intersection of the graphs.

6. $y = 10$ and $y = x + 2$

7. $y = 30 + 3x$ and $y = 5x$

8. $y = 1000 + 40x$ and $y = 75x$

SHARPEN YOUR SKILLS

Sylvia has found the following lodging information in a travel guide.

LOTUS INN
LOTUS, IOWA

I-123 at 33rd Place, S.W.
Exit 3   555-1234
Location: 3322 South Street,
Southwest Lotus 50010
Downtown: 3.5 mi
Ball park: 1 mi
Zoo: 2 mi.
Airport: 7 mi
Restaurants & shopping nearby.

Rates: Tax 8%

1 person single $37.00	2 people double bed $43.00
2 people 2 dble bds $48	4 people 2 dble bds $58

PLEASURE LODGE
MONMOUTH, IOWA

Near International Airport
Indoor Pool   HBO
Health Club   Sauna
Location: 1001 Sandwich Road
Exit Stream Road,
Follow Airport signs.
Complimentary: airport limo,
light breakfast, cable TV.

Rates: Tax 8%. XP $8
Teens free. RB $8

1 person	Standard: $65 Luxury: $90
2 people	Standard: $75 Luxury: $105

All rooms have two double beds.

(XP means extra person)
(RB means roll-away bed)

EXAMPLE 1 Sylvia and her mother want to plan their lodging costs.

QUESTION What would be the cost for Sylvia and her mother to stay at each of these motels for 2 nights? They would take the least expensive room with two double beds.

SOLUTION

At Lotus Inn, two beds for two people cost $48 per night.

$2(48) = 96$ Rate for two nights
$0.08(96) + 96 = 103.68$ The tax is 8%.

The cost at Lotus Inn is $103.68.

At Pleasure Lodge teens can stay free of charge and the least expensive room costs $65.

$2(65) = 130$ Rate for two nights
$1.08(130) = 140.40$ Multiply by 1.08 for room and tax
                      $(100\% + 8\% = 108\%)$.

The cost at Pleasure Lodge is $140.40.
Sylvia and her mother would stay at Lotus Inn.

EXAMPLE 2 Sylvia and her mother want to use the actual cost of their meals while traveling as a reasonable basis for a budget for clients.

QUESTION How can they arrive at a reasonable estimate of the cost for meals?

SOLUTION

The best method is to record a number of prices for meals and then find the average. The following are the amounts spent by Sylvia and her mother. Sylvia used her spreadsheet skills to write formulas that would give totals and averages.

	A	B	C	D	E	F	G
1		Monday	Tuesday	Wednesday	Thursday	Total	Average
2	Breakfast	7.50	12.75	6.28	11.32	37.85	9.46
3	Lunch	12.85	14.50	6.70	9.43	43.48	10.87
4	Dinner	52.45	32.60	44.76	18.40	148.21	37.05
5	Total	72.80	59.85	57.74	39.15	229.54	57.39

+F2/4

@SUM(B2..B4)

On the basis of this record of expenses, Sylvia's mother will recommend to her clients that, for a similar trip, they plan to budget $10 per day for breakfast, $11 per day for lunch, and $37 per day for dinner, or $58 total per day.

Notice that $229.54 is the total of all the daily totals and also the total of all the meal totals. These two totals are equal because they are simply different ways of adding the same numbers. If you were preparing this with a calculator rather than a spreadsheet, this total would provide a check on your calculations.

----- **SKILL 2** -----

EXAMPLE 3 Her mother was so impressed with Sylvia's computer skills that she asked Sylvia to prepare a table in which to record the expenses for their trip.

QUESTION How can a spreadsheet be used to record travel expenses?

SOLUTION

Sylvia set up a budget as follows. Her mother suggests that her clients prepare a budget like this as a target, using their own numbers, and then take a blank form on the trip and fill in the actual amounts.

	A	B	C	D	E	F	G
1		Day 1	Day 2	Day 3	Day 4	Total	Average
2	Food	72.80	59.85	57.74	39.15	229.54	57.39
3	Lodging	56.70	56.70	28.65	31.50	173.55	43.39
4	Car	19.20	0.00	15.60	10.00	44.80	11.20
5	Entertainment	32.00	29.00	8.50	14.75	84.25	21.06
6	Gifts	0.00	13.00	21.68	8.90	43.58	10.90
7	Total	180.70	158.55	132.17	104.30	575.72	143.93

Sylvia's mother sponsors tours for people who like someone else to do the planning. Some of these trips include costs for travel, accommodations, meals, entrance to some attractions, and guided tours. Some costs are fixed, such as chartering a plane. Other costs, such as meal expenses, vary with the number of people on the tour. You can use break-even analysis to determine how many people are needed to make a profit.
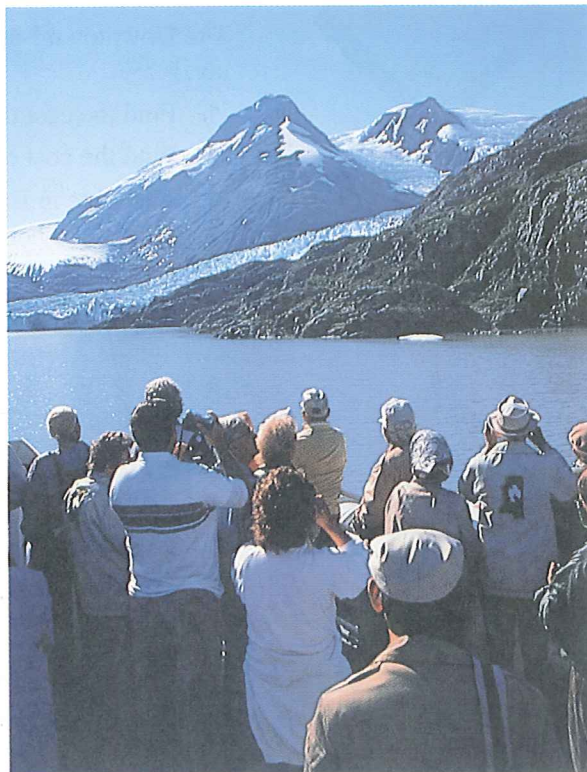
EXAMPLE 4 Sylvia's mother has found that for a certain tour, the fixed cost is $10,000, and the cost per person is $150. She charges $720 per person for the tour.

QUESTION How can Sylvia help her mother determine the number of people needed to break even?

SOLUTION
Graphing equations for income (revenue) and expenses (cost) will show profit and loss.

The equation for income is

$y = 720x$ where x = number of people
                          y = total revenue

The equation for expenses is

$y = 10,000 + 150x$ where $10,000$ = fixed expense
                                     x = number of people
                                     y = total expenses

Graph the equations with the following range values.

Xmin: −2   Ymin: −2500
Xmax: 30   Ymax: 20000
Xscl: 2   Yscl: 2500
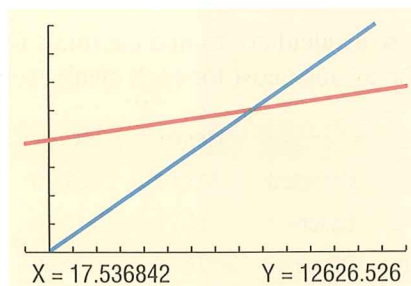
Using the trace function shows a break-even point at about 17.5.

Solve the system of two equations using substitution.

X = 17.536842   Y = 12626.526

$$y = 720x$$
$$y = 10,000 + 150x$$
$$720x = 10,000 + 150x$$
$$570x = 10,000$$
$$x = 17.5$$ To the nearest tenth

To break even, Sylvia's mother will need 18 people on the tour.

TRY YOUR SKILLS

The Downtown Motor Inn charges the following: Single, $47; double, $57; tax, 6.5%.

1. Find the cost of a single for 1 night, with tax.

2. Find the cost of a double for 3 nights, with tax.

3. The table in Example 2 shows amounts spent for restaurant meals by Sylvia and her mother. Find the average amount per person for each meal.

4. On the basis of the information in Example 4, what will be Sylvia's mother's profit if 20 people purchase the tour?

EXERCISE YOUR SKILLS

The following summarizes the costs at two different hotels.

Milledgeville Lodge	Georgia Inn
Rates: single, $48	Rates: single, $39
2 adults, $56	2 adults, $48
Teens, free	Teens, $10
Tax: 8% on room only	Tax: 8% on room only
Free in-room movies	Video rental: $7.00
Game machines	Miniature golf, $3.00

Find each of the following costs.

1. Two adults at the Milledgville Lodge for 3 nights

2. Single at the Georgia Inn for 2 nights, with 1 video rental

3. Two adults and 2 teens at the Georgia Inn for 4 nights, with 2 rounds of miniature golf per person and 2 video rentals

Use a calculator to find the totals for each day, the totals for each meal, and the average cost for each meal; each cost shown is for a family of four.

		Monday	Tuesday	Wednesday	Thursday	Total	Average
4.	Breakfast	$17.50	$22.75	$19.54	$23.32		
5.	Lunch	28.75	24.50	15.27	17.43		
6.	Dinner	78.45	32.60	58.36	98.63		
7.	Total						

8. How can you double check your totals?

9. Using these averages and the rates listed above, prepare a food and lodging budget for a family of four (2 adults, 2 teens) to stay at the Milledgeville Lodge for 3 days.

A travel agent prepares a tour package, charging $560 per person. The tour has fixed costs of $7500 and a per person cost of $180.

10. Write an equation for the total revenue of the travel agency.

11. Write an equation for the total expenses of the travel agency.

12. Set up a range and use a graphing calculator to graph the equations.

13. Use the graphs to find the break-even point for the tour.

14. Find the break-even point by solving the system of equations.

15. What will be the profit or loss if 15 people take the tour?

16. What will be the profit or loss if 28 people take the tour?

John and Harriet Gomez operate a restaurant. Their average costs per day are $500 fixed, $10 per person having dinner. The average amount spent by a person having dinner is $20.

17. How many dinner patrons are needed for the Gomezes to break even?

18. What is the financial result of having only 35 dinner patrons?

19. How does the Gomezes' thinking about the price of dinner differ from the thinking of one of their patrons coming for dinner?

20. How might lowering the average price of dinner lead the Gomezes to earn less money from their restaurant?

21. How might lowering the average price of dinner lead the Gomezes to earn more money from their restaurant?

22. Without actually lowering the prices, how might the Gomezes determine whether this would be a good strategy?

A tour company arranges a bus tour. The advertised price is $445 per person. The tour has fixed costs of $9100 and a per person cost of $225.

23. Write an equation for the amount paid in to the tour company.

24. Write an equation for the amount paid out by the tour company.

25. The number of people able to take the tour is limited by the fact that the bus has a maximum capacity of 45 passengers. Will the tour company be able to make a profit?

26. Suppose 50 people sign up for this tour. Accommodating the extra people will raise the fixed costs to $12,350 and lower the cost per person to $210. The price of the tour must remain at $445 per person. Should the tour company accept reservations from 50 people, or maintain a limit of 45 people? Explain your answer.

MIXED REVIEW

1. Marsha's job at the library pays her $12.50 plus $1\frac{1}{2}$ times her regular wage rate for each hour over 35 hours. How much did she earn in a week during which she worked 42 hours?

2. Keisha earns $9.50 per hour. She works $37\frac{1}{2}$ hours per week for 49 weeks and received 3 weeks of paid vacation. Her other benefits cost her employer $4000 per year. What is the annual cost to the company of her salary and benefits?

Liam's bank pays interest of 0.25% per month on his checking account. It imposes a monthly service charge of $6 for balances under $200, $5 for balances between $200 and $499, and no service charge for balances over $499. For balances under $500 there is a charge of $0.02 for each check. Find the new balance in a checking account with the given balance and number of checks written.

3. $501; 22 checks

4. $400; 15 checks

5. Determine which of the following loans has a greater total cost.

   a. $12,000 at 14% for 5 years

   b. $15,000 at 11% for 4 years

The annual depreciation on a new $20,000 car is 25% immediately upon purchase. At the end of each year that follows, the percent of depreciation from the original price changes as follows: 20%, 12%, 10%, 8%, 7%, 6%, 5%, 4%, 3%. Find the value of the car at the times indicated in Exercises 6–8.

6. Immediately after purchase

7. In 1 year

8. In 5 years

Use the Rule of 72 to find how many years it will take for $3000 to grow to $24,000 at the given rates of interest.

9. 5.25%

10. 7.5%

11. 9%

José bought 1500 shares of stock at $43\frac{1}{8}$ per share. In Exercises 12–14 ignore the commission costs.

12. Find the cost of the shares.

13. After three years, José sold the shares at $57\frac{3}{8}$ per share. What was the total sale price?

14. What was the capital gain or loss on the shares?

A loan of $10,000 is repaid one year later in a single payment of $10,900.

15. What was the interest paid on the loan?

16. What was the rate of interest on the loan?