

BILLER BONUS

Comparing Credit Cards



With features such as miles toward air travel, insurance on rental cars, and special introductory rates, shopping for a credit card can be a daunting task. You can search the Internet for the most current information regarding annual fees and interest rates. Compare credit cards at Web sites such as Bankrate.com and CardWeb.com. Also check *Consumer Reports'* site, www.consumerreports.org, for the "ten most consumer-friendly credit cards."

the billing period is \$2500 added for each of the first 7 days, expressed as $\$2500 \times 7$, plus \$1500 added for each of the remaining 24 days, expressed as $\$1500 \times 24$.

Average daily balance

$$= \frac{\text{Sum of the unpaid balances for each day in the billing period}}{\text{Number of days in the billing period}}$$

$$= \frac{\$2500(7) + \$1500(24)}{31} \approx \$1725.81$$

The average daily balance serves as the principal. The interest is

$$I = Prt = \$1725.81 \times 0.0175 \times 1 \approx \$30.20.$$

The interest due on the payment due date is \$30.20.

Most credit cards use the average daily balance method to determine interest due. Calculating the average daily balance by hand can be quite tedious when there are numerous transactions during a billing period. Credit card customers who are charged interest by the average daily balance method will find the average daily balance provided on monthly statements.

6 A credit card has a monthly rate of 1.8%. In the January 1–January 31 itemized billing, the January 1 unpaid balance is \$6800. A payment of \$500 was received on January 8. There are no purchases or cash advances in this billing period. The payment due date is February 9. Find the interest due on this date using each of the three methods for calculating credit card interest.

EXERCISE SET 8.5

Practice and Application Exercises

- The cost of a sports utility vehicle is \$27,000. We can finance this by paying \$5000 down and \$410 per month for 60 months. Determine a. the amount financed; b. the total installment price; c. the finance charge.
- The cost of a computer is \$2450. We can finance this by paying \$550 down and \$94.50 per month for 24 months. Determine a. the amount financed; b. the total installment price; c. the finance charge.
- The cost of a washer-dryer is \$1100. We can finance this by paying \$100 down and \$110 per month for 12 months. Determine a. the amount financed; b. the total installment price; c. the finance charge.
- The cost of a used car is \$5675. We can finance this by paying \$1223 down and \$125 per month for 48 months. Determine a. the amount financed; b. the total installment price; c. the finance charge.
- You plan to pay for a computer in 12 equal monthly payments. The finance charge per \$100 financed is \$6.90. Use Table 8.5 on page 482 to find the APR for this loan.
- You plan to pay for a refrigerator in 18 equal monthly payments. The finance charge per \$100 financed is \$12.72. Use Table 8.5 on page 482 to find the APR for this loan.
- The finance charge per \$100 financed for a computer that is paid off in 24 equal monthly payments is \$15.80. Use Table 8.5 on page 482 to find the APR for this loan.
- The finance charge per \$100 financed for a refrigerator that is paid off in 12 monthly payments is \$8.59. Use Table 8.5 on page 482 to find the APR for this loan.
- A used car is financed for \$4450 over 48 months. If the total finance charge is \$1279, find the APR for this loan.
- A desk is financed for \$1200 over 30 months. If the total finance charge is \$264, find the APR for this loan.
- The cash price for furniture for all rooms of a three-bedroom house is \$17,500. The furniture can be financed by paying \$500 down and \$360.55 per month for 60 months.
 - Determine the amount financed.
 - Determine the total installment price.
 - Determine the finance charge.
 - What is the APR for this loan?

12. The cost of a Blazer is \$18,000, which can be financed by paying \$600 down and \$385 per month for 60 months.
- Determine the amount financed.
 - Determine the total installment price.
 - Determine the finance charge.
 - What is the APR for this loan?

13. In Exercise 11, instead of making the twenty-fourth payment, the borrower decides to pay the remaining balance and terminate the loan for the furniture.
- Use the actuarial method to determine how much interest will be saved by repaying the loan early.
 - By the actuarial method, what is the total amount due on the day of the loan's termination?
 - Use the rule of 78 to determine how much interest will be saved by repaying the loan early.
 - By the rule of 78, what is the total amount due on the day of the loan's termination?

14. In Exercise 12, instead of making the twenty-fourth payment, the borrower decides to pay the remaining balance and terminate the loan for the Blazer.
- Use the actuarial method to determine how much interest will be saved by repaying the loan early.
 - By the actuarial method, what is the total amount due on the day of the loan's termination?
 - Use the rule of 78 to determine how much interest will be saved by repaying the loan early.
 - By the rule of 78, what is the total amount due on the day of the loan's termination?

15. A particular VISA card calculates interest using the unpaid balance method. The monthly interest rate is 1.3% on the unpaid balance on the first day of the billing period less payments and credits. Here are some of the details in the May 1–May 31 itemized billing:

May 1 Unpaid Balance: \$950
 Payment Received May 8: \$100
 Purchases Charged to the VISA Account: clothing, \$85 and car repair, \$67
 Last Day of the Billing Period: May 31
 Payment Due Date: June 9

- Find the interest due on the payment due date.
 - Find the total balance owed on the last day of the billing period.
 - This credit card requires a \$10 minimum monthly payment if the total balance owed on the last day of the billing period is less than \$360. Otherwise, the minimum monthly payment is $\frac{1}{36}$ of the balance owed on the last day of the billing period, rounded to the nearest whole dollar. What is the minimum monthly payment due by June 9?
16. A particular credit card calculates interest using the unpaid balance method. The monthly interest rate is 1.75% on the unpaid balance on the first day of the billing period less payments and credits. Here are some of the details in the September 1–September 30 itemized billing:
- September 1 Unpaid Balance: \$425
 Payment Received September 6: \$75
 Purchases Charged to the Account: groceries, \$45 and clothing, \$77
 Last Day of the Billing Period: September 30
 Payment Due Date: October 9

- Find the interest due on the payment due date.
- Find the total balance owed on the last day of the billing period.
- Terms for this credit card are shown in the following table. What is the minimum monthly payment due by October 9?

New Balance	Minimum Payment
\$0.01 to \$10.00	No payment due
10.01 to 200.00	\$10.00
200.01 to 250.00	15.00
250.01 to 300.00	20.00
300.01 to 350.00	25.00
350.01 to 400.00	30.00
400.01 to 450.00	35.00
450.01 to 500.00	40.00
Over \$500.00	$\frac{1}{10}$ of new balance

17. A credit card has a monthly rate of 1.5% and uses the average daily balance method for calculating interest. Here are some of the details in the April 1–April 30 itemized billing:
- April 1 Unpaid Balance: \$445.59
 Payment Received April 5: \$110
 Purchases Charged to the Account: \$278.06
 Average Daily Balance: \$330.90
 Last Day of the Billing Period: April 30
 Payment Due Date: May 9
- Find the interest due on the payment due date.
 - Find the total balance owed on the last day of the billing period.
 - Terms for this credit card are given in Exercise 16. What is the minimum monthly payment due by May 9?
18. A credit card has a monthly rate of 1.8% and uses the average daily balance method for calculating interest. Here are some of the details in the December 1–December 31 itemized billing:
- December 1 Unpaid Balance: \$220
 Payment Received December 7: \$60
 Purchases Charged to the Account: \$90
 Average Daily Balance: \$205.60
 Last Day of the Billing Period: December 31
 Payment Due Date: January 9
- Find the interest due on the payment due date.
 - Find the total balance owed on the last day of the billing period.
 - Terms for this credit card are given in Exercise 16. What is the minimum monthly payment due on January 9?
19. A credit card has a monthly rate of 1.5%. In the September 1–September 30 itemized billing, the September 1 unpaid balance is \$3000. A payment of \$2500 was received on September 6. There are no purchases or cash advances in this billing period. The payment due date is October 9. Find the interest due on this date using
- the unpaid balance method.
 - the previous balance method.
 - the average daily balance method.

20. A credit card has a monthly rate of 2.2%. In the October 1–October 31 itemized billing, the October 1 unpaid balance is \$2000. A payment of \$400 was received on October 6. There are no purchases or cash advances in this billing period. The payment due date is November 9. Find the interest due on this date using
- the unpaid balance method.
 - the previous balance method.
 - the average daily balance method.

• Writing in Mathematics

- Describe the difference between a fixed installment loan and an open-end installment loan.
- For a fixed installment loan, what is the total installment price?
- For a fixed installment loan, how is the total finance charge determined?
- What is the APR?
- What are the two methods for computing unearned interest when a loan is paid off early? Describe how the payoff amount is determined regardless of which method is used in the computation.
- Name and describe each of the three methods for calculating interest on credit cards.
- For a credit card billing period, describe how the average daily balance is determined. Why is this computation somewhat tedious when done by hand?
- Which method for calculating interest on credit cards is most beneficial to the borrower and which is least beneficial? Explain why this is so.
- A Sears Revolving Charge Card has a monthly rate of 1.75%. The interest is a minimum of 50¢ if the average daily balance is \$28.50 or less. Explain how this policy is beneficial to Sears.

• Critical Thinking Exercise

- Which one of the following is true?
 - The finance charge on a fixed installment loan is the cash price minus the total installment price.
 - It is to a borrower's advantage to have unearned interest computed by the rule of 78 rather than by the actuarial method.
 - It is not necessary to know the number of days in a credit card billing period to determine the average daily balance.
 - If a credit card has a 2.2% monthly interest rate, the annual rate exceeds 25%.

Use estimation and not calculation to select the most reasonable value in Exercises 31–32.

- If you purchase a \$1400 item, put \$200 down, and pay the balance in 30 monthly installments, what is a reasonable estimate of the monthly payment?
 - \$35
 - \$47
 - \$70
 - \$100

- A reasonable estimate of the monthly interest on an average daily balance of \$359.58 at a 1.3% monthly rate is
 - \$50
 - \$10
 - \$5
 - \$2
- A bank bills its credit card holders on the first of each month for each itemized billing. The card provides a 20-day period in which to pay the bill before charging interest. If the card holder wants to buy an expensive gift for a September 30 wedding but can't pay for it until November 5, explain how this can be done without adding an interest charge.
- A \$1500 computer can be purchased using a credit card that charges a monthly rate of 1.5% using the unpaid balance method. The borrower is considering one of the following options:

Option A: Make a credit card payment of \$300 at the end of each month for five months and pay off the balance at the end of the sixth month.

Option B: Make a credit card payment of \$300 plus the month's interest at the end of each month for five months.

How much is saved in interest using option B?

• Technology Exercises

- Set up a spreadsheet with one column each for the balance, number of days at that balance, payments, charges, and the product of each balance and the number of days at that balance. The balance on John and Jane Doe's credit card on July 5, their billing date, was \$375.80. For the period ending August 4, they had the following transactions:

July 13, Payment: \$150.00
 July 15, Charge: Computer Store, \$74.35
 July 23, Charge: Clothing, \$123.50
 July 29, Charge: Restaurant, \$42.50

 - Use the summation capabilities of the spreadsheet to determine the number of days in the billing period and the average daily balance.
 - Find the finance charge (the interest) that is owed on August 4. Assume the monthly rate is 1.3%.
 - Find the balance that is owed on August 4.
- Set up a spreadsheet with one column each for the balance, number of days at that balance, payments, charges, and the product of each balance and the number of days at that balance. The balance on the Does' credit card on May 12, their billing date, was \$378.50. For the period ending June 11, they had the following transactions:

May 13, Charge: Toys, \$129.79
 May 15, Payment: \$50.00
 May 18, Charge: Clothing, \$135.85
 May 29, Charge: Housewares, \$37.63

 - Use the summation capabilities of the spreadsheet to determine the number of days in the billing period and the average daily balance.
 - Find the finance charge (the interest) that is owed on June 11. Assume the monthly rate is 0.75%.
 - Find the balance that is owed on June 11.

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Determine the APR.

STUDY TIP

Do not confuse effective annual yield with annual percentage rate. Effective annual yield applies to *interest earned* on invested money. By contrast, annual percentage rate applies to *interest owed* on loans.

In Example 1, the finance charge for the loan, \$2617.80, is the **interest** paid to finance the truck. What interest rate are we paying when we pay \$2617.80 interest over 60 months? The interest rate per year is called the **annual percentage rate**, abbreviated **APR**. In 1969, the Federal Reserve Board established the **Truth-in-Lending Act**. It requires lending institutions to inform borrowers in writing of a loan's APR. **When comparing two or more loans with different terms, the loan with the lowest APR is the one that charges the least interest.** For many people, an important factor in deciding on a fixed installment loan is the cash down payment that is required. If you do not have a lot of cash at the time of purchase, you might select a loan with a smaller down payment even though it has a not-so-desirable APR.

The APR for a fixed installment loan can be determined using a table similar to the abbreviated version shown in Table 8.5. Here are the steps involved in using an APR table. These steps are illustrated in Example 2.

STEPS IN USING AN APR TABLE

1. Compute the finance charge per \$100 financed:

$$\frac{\text{Finance charge}}{\text{Amount financed}} \times \$100.$$

2. Look in the row corresponding to the number of payments to be made and find the entry closest to the value in step 1.
3. Find the APR at the top of the column in which the entry from step 2 is found. (This is the APR rounded to the nearest $\frac{1}{2}\%$.)

TABLE 8.5 ANNUAL PERCENTAGE RATE (APR) FOR MONTHLY PAYMENT LOANS

Number of Monthly Payments	Annual Percentage Rate (APR)												
	10.0%	10.5%	11.0%	11.5%	12.0%	12.5%	13.0%	13.5%	14.0%	14.5%	15.0%	15.5%	16.0%
	(Finance charge per \$100 of amount financed)												
6	\$2.94	\$3.08	\$3.23	\$3.38	\$3.53	\$3.68	\$3.83	\$3.97	\$4.12	\$4.27	\$4.42	\$4.57	\$4.72
12	5.50	5.78	6.06	6.34	6.62	6.90	7.18	7.46	7.74	8.03	8.31	8.59	8.88
18	8.10	8.52	8.93	9.35	9.77	10.19	10.61	11.03	11.45	11.87	12.29	12.72	13.14
24	10.75	11.30	11.86	12.42	12.98	13.54	14.10	14.66	15.23	15.80	16.37	16.94	17.51
30	13.43	14.13	14.83	15.54	16.24	16.95	17.66	18.38	19.10	19.81	20.54	21.26	21.99
36	16.16	17.01	17.86	18.71	19.57	20.43	21.30	22.17	23.04	23.92	24.80	25.68	26.57
48	21.74	22.90	24.06	25.23	26.40	27.58	28.77	29.97	31.17	32.37	33.59	34.81	36.03
60	27.48	28.96	30.45	31.96	33.47	34.99	36.52	38.06	39.61	41.17	42.74	44.32	45.91

EXAMPLE 2 DETERMINING THE APR

In Example 1, we found that the amount financed for the truck was \$9045 and the finance charge was \$2617.80. The borrower financed the truck with 60 monthly payments. Use Table 8.5 to determine the APR.

SOLUTION

Step 1. Find the finance charge per \$100 of the amount financed.

$$\begin{aligned} \text{Finance charge per } \$100 \text{ financed} &= \frac{\text{Finance charge}}{\text{Amount financed}} \times \$100 \\ &= \frac{\$2617.80}{\$9045.00} \times \$100 \\ &\approx \$28.94 \end{aligned}$$

This means that the borrower pays \$28.94 interest for each \$100 being financed.