Credit Card Basics (Part 1)

Extend Your Learning
Answers and Explanations

1. You have a credit card with APR of 16.5%, where interest is compounded monthly.

   a. How much will you owe after one year, without considering late fees, on a beginning balance of $562.30 if you do not make any additional purchases?
   The initial balance is $562.30.
   The monthly interest rate is 16.5% ÷ 12, or 1.375%
   Amount Owed = $562.30(1+ 0.01375)^{12}$
   Amount Owed (rounded to the nearest cent) = $662.43

   b. What is the effective annual rate for this credit card?
   You start with a balance of $562.30 and pay a total of $662.43, so you pay $662.43 - $562.30, or $100.13 in interest. Divide 100.13 by 562.30 to find the percent of interest paid. (100.13 ÷ 562.30 ≈ 0.17807 or 17.81%)

   c. What is the difference between the APR and EAR for this scenario?
   17.81% - 16.5% = 1.31%

   d. What is the difference in the amount owed at the end of one year using the APR as a simple interest rate versus using the effective annual rate to calculate the interest?
   Simple interest: 116.5% x $562.30 = $655.08 (rounded to the nearest cent)
   Compounding: $562.30(1+ 0.01375)^{12} = $662.43
   Difference: $662.43 - $655.08 = $7.35

2. You are thinking about getting your first credit card. Consider the following two options.

Big Dreams Credit Card	
APR	Annual Fee
9.75%	$50.00

Adventures Student Card	
APR	Annual Fee
19.8%	$0

   a. Suppose you pay off the total balance owed each month. Which of the credit card options given is better? Why?
   In this situation, the Adventures credit card option is better because no interest is charged when you pay off the total balance each month. Although the interest rate for this card is higher than for the other card, this does not matter, since no interest is ever charged. The Big Dreams card, however, has an annual fee, so even though you will not be charged any interest on your purchases you will have to pay $50 each year in addition to paying off the cost of the purchases.

b. If you had a starting balance of $2000 at the beginning of the year, and you made no payments or additional purchases, for which credit card given above would you owe more at the end of one year? Neglect the effect of late fees.

The total amount owed at the end of one year for each card is given by the following formulas:

Big Dreams: $B = 2000(1 + \frac{.0975}{12})^{12} + 50$

$\approx \$2253.95$

Adventures: $B = 2000(1 + \frac{.198}{12})^{12}$

$\approx \$2433.99$

The amount owed on the Adventures card is much higher than the amount owed on the Big Dreams card because the interest rate for this card is much higher than that for the other card. The $50 annual fee on the Big Dreams card has less impact than the interest rate on the overall amount owed.

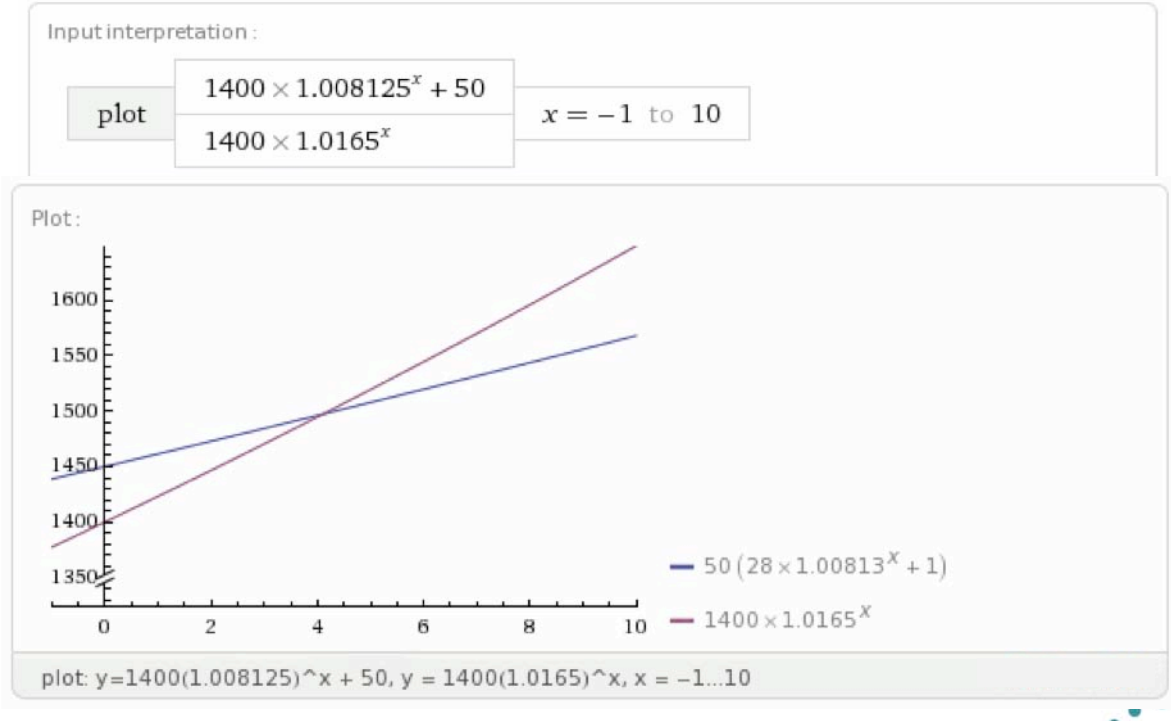
c. Estimate when the amounts owed for each card are equal if the starting balance is $1400 by graphing. Draw a sketch to help you estimate below. Check your results with a graphing calculator or computer program.

The balance owed, *B*, on each card after *n* months, for a starting balance of $1400 dollars is given by:

Big Dreams: $B = 1400(1.008125)^n + 50$

Adventures: $B = 1400(1.0165)^n$

We want to determine when these two expressions are equal by graphing the equations and looking for intersection points. The graphs should look something like this.



The graphs of the two equations intersect at about 4, so at the end of four months the amount owed on a staring balance of $1400 for either credit card option is approximately the same.

d. Which credit card option would be a better option for you personally? Explain.
Answers will vary, depending on students' repayment habits. The Big Dreams credit card option is generally better for those who do not always pay off their total balance due each month, and the Adventures option is better for those who do pay off the total balance due each month.