



SECTION 7A

Quant MULTI-STEP TEST PREP



Exponential Functions and Logarithms

Charged Up There are more than 1 billion credit cards in circulation in the United States, and the average American carries a credit card debt of approximately \$8600. Given that many credit cards charge an annual percentage rate (APR) of 18.3%, it can be difficult to escape the "credit hole."

The formula shown below can be used to compute the monthly payment M that is necessary to pay off a credit card balance P in a given number of years t . In the formula, r is the annual percentage rate and n is the number of payments per year.

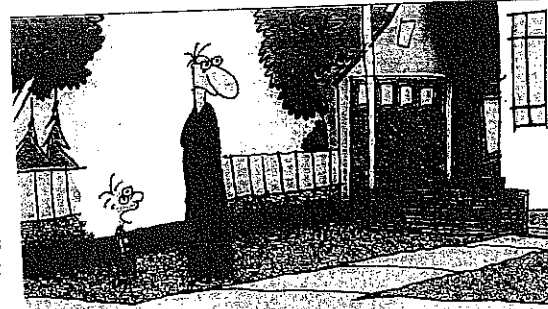
$$M = \frac{P\left(\frac{r}{n}\right)}{1 - \left(1 + \frac{r}{n}\right)^{-nt}}$$

1. Suppose that you have a balance of \$8600 on a credit card with an APR of 18.3%. What monthly payment should you make in order to pay off the debt in exactly five years?

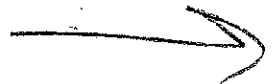
Solve the equation above for t .

2. How much money do you end up paying altogether over the five years?

3. If you can afford only a monthly payment of \$160, how long will it take to pay off the credit card debt?



"I didn't have time to mow the lawn, so I used your credit card to have it carpeted."



4. Suppose you can afford a monthly payment of \$130. Will you be able to pay off the debt? If so, how long will it take? If not, why not?

5. What is the minimum monthly payment that will work toward paying off the debt?