

You have received your monthly credit card statement and must now deal with the financial realities of last month's birthday celebration. While your milestone in years was deserving of a celebration, dealing with the \$2000 in credit card charges will require some planning.

Your credit card statement lists the APR (Annual Percentage Rate) for your balance to be 14.5%. This is the yearly interest rate the credit card company uses in calculating interest due on your balance. The credit card company compounds interest monthly. Your monthly interest rate on credit card charges will be:

$$i = \frac{APR}{12} = \frac{0.145}{12} \approx 0.012083$$

The minimum payment required by your credit card company is \$25/month. Assuming that you do not make any new charges to your account, answer the following questions to help you determine the best plan for paying off this credit card debt.

1. To begin with, let's check out the plan of only paying the minimum amount due each month. To get a feel for how this will affect the balance, finish filling in the following table using the minimum monthly payment of \$25.

Month	Old Balance	Interest	Payment	New Balance
1	\$2000.00	\$24.17	\$25.00	\$1999.17
2	\$1999.17	\$24.16	25.00	1998.33
3	1998.33	\$24.15	25.00	1997.48
4	1997.48	\$24.14	25.00	1996.62
5	1996.62	\$24.13	25.00	1995.75
6	1995.75	\$24.11	25.00	1994.86
7	1994.86	\$24.10	25.00	1993.96
8	1993.96	\$24.09	25.00	1993.05
9	1993.09	\$24.08	25.00	1992.13
10	1992.13	\$24.07	25.00	1991.20
11	1991.20	\$24.06	25.00	1990.26
12	1990.26	\$24.05	25.00	1989.31

What is the total amount that has been paid to the credit card company at the end of the first year?

\$10.69

How much of the original balance has been paid off at the end of the first year?

\$10.69

From looking at the new balances over the first year, how many years do you think it will take to pay off the \$2000? (This is a guess so there is no wrong answer. Before going on to step 2, write down your best estimate.)

15 years

$$25 = \frac{2000 \cdot .01208}{1 - (1 + .01208)^{-m}}$$

$$25(1 - (1 + .01208)^{-m}) = 24.166$$

$$\frac{25000(1 - (1 + .01208)^{-m})}{25000} = \frac{24166}{25000}$$

$$1 - (1 + .01208)^{-m}$$

↑

Problem 2

2. A formula for calculating the payment, P , required to pay off a debt of amount D in M months with monthly interest rate i is

$$P = \frac{D \cdot i}{1 - (1+i)^{-M}}$$

Using this formula, solve for M to determine the number of months it will take to pay off the \$2000 credit card debt with minimum monthly payments of \$25. Round the number of months to two decimal places. (Attach all work for this assignment to the end.)

$$25 = \frac{2000 \cdot 0.012083}{1 - (1 + 0.012083)^{-M}} \quad (1 + 0.012083)^{-M} (25) = 24.166$$

$$M = 283.12$$

How long is this in years, rounded to the nearest tenth of a year?

23.6 ~~months~~ years

What is the total amount paid to the credit card company, rounded to the nearest dollar?

AA

\$2,265

3. How many months will be required to pay off the debt if you pay \$50 each month? Round to two decimal places.

54.99 months

How long is this in years, rounded to the nearest tenth of a year?

4.6 years

What is the total amount paid to the credit card company, rounded to the nearest dollar?

$$(54.99)(50) = 2,750$$

4. How many months will be required to pay off the debt if you pay \$75 each month? Round to two decimal places.

32.38

How long is this in years, rounded to the nearest tenth of a year?

2.7 years

What is the total amount paid to the credit card company, rounded to the nearest dollar?

$$(32.38)(75) = 2,429$$

5. How large would your monthly payment have to be in order to pay off your debt in 12 months? Round up to the next nearest cent.

166.67

What is the total amount paid to the credit card company, rounded to the nearest dollar?

~~12(166.67) = 2000~~ 2161

6. What is the best plan for paying off the \$2000? Why?

Depends on what you can afford each month

What is the worst plan? Why?

Paying 25 a month because interest adds up the longer it takes

What should you do if you cannot afford to make the payments required by the best plan?

You do the plan you can afford

7. What are two things that the average consumer can learn by completing this assignment?

i. How to calculate interest

ii. How to calculate how much money you pay.