

§4A. Taking Control of your Finances

Controlling Your Finances

- * Know your bank balances
- * Know what you spend, including debit and credit transactions
- * Avoid impulse spending
- * Make and follow a budget

A Four-Step Budget:

- * Definition: Prorating involves determining how much an amount (income or payment) averages out to each month.

Step 1: List all your income, including prorated amounts where applicable.

Step 2: List all your expenses, including prorated amounts where applicable.

Step 3: Subtract your MONTHLY expenses from your MONTHLY income to get your monthly cash flow.

- * If monthly cash flow is positive, you are spending less than you make
- * If monthly cash flow is negative, you are overspending.

Step 4: Make any adjustments needed to avoid debt.

Ex: How much is that?

You are living on a college budget, but you still like to have a soda every day after classes (5 days a week). Assume a soda costs \$1.25.

If you have 1 soda 5 days a week for 3.5 months, how much do you pay? Take 1 month = 4 weeks.

$$\begin{array}{l} \text{Solution: } 3.5 \text{ mo} \mid 20 \text{ days} \mid = 70 \text{ days} \\ \qquad \qquad \qquad \qquad \mid 1 \text{ mo} \\ 70 \text{ days} \mid \$1.25 \mid = \$87.50 \\ \qquad \qquad \qquad \qquad \mid 1 \text{ day} \end{array}$$

Ex: Suppose you owe \$2000 on a credit card charging 24% interest per year. If the card charges 2% interest per month, how much do you owe in interest each month? Year?

Solution: $2\% = .02$

$$\text{Monthly interest} = \$2000 \times .02 = \$40.00$$

$$\text{Yearly} = \$40.00 \times 12 = \$480$$

Ex: Find the monthly cost:

\$4,500 bill for tuition for two semesters

\$300 for books each semesters

Solution: We must prorate

$$\$4500 \times 2 = \$9000 \text{ yearly}$$

$$\$300 \times 2 = \$600 \text{ yearly}$$

So we owe \$9600 yearly. Then,

$$\begin{array}{r|l} \$9600 & 1 \text{ year} \\ \hline & \text{year} \quad | \quad 12 \text{ mo} \end{array} = \$800 \text{ per month}$$

Ex: Find the prorated amount in \$ per month

\$500 per month for rent

\$800 for car insurance every 6 months

\$900 membership fee annually.

Solution: \$500 per month rent

$$\begin{array}{r|l} \$800 & \\ \hline & 6 \text{ months} \end{array} = \$133.33 \text{ per month}$$

$$\begin{array}{r|l} \$900 & \\ \hline & 12 \text{ months} \end{array} = \$75 \text{ per month}$$

$$\$500 + \$133.33 + \$75 = \$708.33 \text{ per month}$$

Ex: Compute the net MONTHLY cash flow:

Income	Expenses
Part-time Job: \$ 600 / month	Rent: \$ 450 / month
Scholarship: \$ 5000 / year	Groceries: \$ 50 / month
College fund: \$ 400 / month	Tuition: \$ 3000 every 6 mo
	Incidentals: \$ 100 / week

Solution:

$$\begin{array}{l} \text{Incoming cash: } \frac{\$ 600}{\text{month}} + \frac{\$ 5000}{\text{year}} \Bigg| \frac{1 \text{ year}}{12 \text{ mo}} + \frac{\$ 400}{\text{mo}} \\ = \$ 600 + \$ 417 + \$ 400 = \$ 1417 / \text{month} \end{array}$$

$$\begin{array}{l} \text{Outgoing cash: } \frac{\$ 450}{\text{month}} + \frac{\$ 50}{\text{week}} \Bigg| \frac{4 \text{ weeks}}{1 \text{ mo}} + \frac{\$ 3000}{6 \text{ mo}} \\ \quad \quad \quad + \frac{\$ 100}{\text{week}} \Bigg| \frac{4 \text{ weeks}}{1 \text{ mo}} \\ = \$ 450 / \text{mo} + \$ 200 / \text{mo} + \$ 500 / \text{mo} + \$ 400 / \text{mo} \\ = \$ 1550 / \text{mo} \end{array}$$

$$\begin{aligned} \text{The monthly cash flow (net)} &= \$ 1417 - \$ 1550 \\ &= -\$ 133.00 \end{aligned}$$

With this example, the person is going into debt.

Algebra Review

The three basic rules:

1. If $x = y$, then $y = x$

2. You can add/subtract the same quantity from both sides of an equation.

3. You can multiply/divide the same nonzero quantity from both sides of an equation.

Examples: $x + 9 = 1 \Rightarrow x = 1 - 9 = -8$

$$y - \frac{3}{5} = \frac{2}{5} \Rightarrow y = \frac{2}{5} + \frac{3}{5} = \frac{5}{5} = 1$$

$$2z = 4 \Rightarrow z = \frac{4}{2} = 2$$

$$5y - 4 = 2 \Rightarrow 5y = 6 \Rightarrow y = \frac{6}{5}$$

Ex: Solve $3P - 4Z = 3R$ for R , P , and then Z .

Solution: Solve for R :

$$3P - 4Z = 3R \Rightarrow R = \frac{1}{3}(3P - 4Z)$$

using rule 1 and 3.

Solve for P :

$$3P - 4Z = 3R \Rightarrow 3P = 3R + 4Z$$

$$\Rightarrow P = \frac{1}{3}(3R + 4Z)$$

Solve for Z :

$$3P - 4Z = 3R \Rightarrow -4Z = 3R - 3P$$

$$\Rightarrow Z = -\frac{3R - 3P}{4} = -\frac{1}{4}(3R - 3P)$$

So, $R = \frac{1}{3}(3P - 4Z)$; $P = \frac{1}{3}(3R + 4Z)$; and

$$Z = -\frac{1}{4}(3R - 3P)$$

Two more rules:

4.) You can raise both sides of an equation to a power

5.) You can take the same root of both sides of an equation.

Recall that: $\sqrt{x} = x^{\frac{1}{2}}$, $\sqrt[5]{3} = 3^{\frac{1}{5}}$, so
 $\sqrt[n]{x} = x^{\frac{1}{n}}$

Noting this, a root is just a power, so rule 4 and 5 are actually the same.

Examples: $\sqrt[3]{x} = 27 \Rightarrow (x^{\frac{1}{3}})^3 = 27^3 \Rightarrow x = 27^3$

$$\sqrt[5]{2x} = 1 \Rightarrow 2x = 1^5 \Rightarrow x = \frac{1}{2}$$

$$y^3 = 5 \Rightarrow y = 5^{\frac{1}{3}} = \sqrt[3]{5}$$

$$3 + \sqrt[4]{x} = 5 \Rightarrow \sqrt[4]{x} = 2 \Rightarrow x = 2^4$$

Recall that: $\sqrt{16} = 16^{\frac{1}{2}}$ has two answers since

$$-4 \cdot -4 = 16 \quad \text{and}$$

$$4 \cdot 4 = 16$$

So, $\sqrt{16} = \pm 4$. This happens with all even powers, such as \sqrt{x} , $\sqrt[4]{x}$, etc.

In other words, the square root, fourth root, sixth root, eighth root, etc have both a negative and a positive answer.