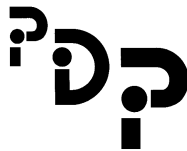


*Zillions of Practice Problems*  
*Pre-Algebra 1 with Biology*

Stanley F. Schmidt, Ph.D.



Polka Dot Publishing

## *How This Book Is Organized*

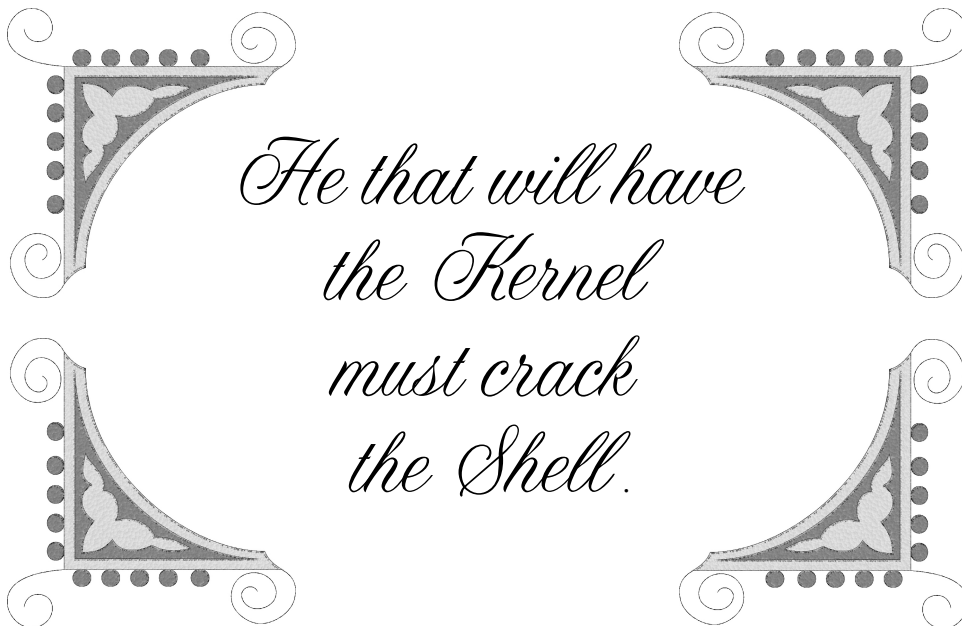
*Life of Fred: Pre-Algebra 1 with Biology* has 45 chapters before the *entre nous* extra chapter. So does this book.

As you work through each chapter in *Life of Fred: Pre-Algebra 1 with Biology* you can do the problems in the corresponding chapter in this book.

Each chapter in this book is divided into two parts.

- ★ The first part takes each topic and offers a zillion problems.
- ★ The second part is called the *Mixed Bag*. It consists of a variety of problems from the chapter and review problems from the beginning of the book up to that point.

Please write down your answers before turning to the back of the book to look at my answers. If you just read the questions and then read my answers you will learn very little. As Thomas Fuller (in about 1700) used to say,



# Chapter Two

## What Is Life?

### First part: Problems from this chapter

150. Right now, you could divide the entire physical universe into two sets: those things that are not alive and those things that are alive.

The **union** of those two sets is equal to every physical thing in the universe.

Those two sets are **disjoint** because those two sets do not have anything in common. You are either not alive or you are alive.

Suppose I divide the entire physical universe into these two sets: Set A = everything that weighs less than 4 kilograms and Set B = everything that weighs more than 3 kilograms.

Is the union of A and B equal to the entire physical universe?

Are A and B disjoint?

272. Suppose set E = everything that you have ever seen or touched. Let set F = everything that your best friend, Jan, has ever seen or touched.

Does the union of E and F equal the entire physical universe?

Are E and F disjoint?

454. Every sticker in my sticker collection was either given to me or I bought it at the store. If set G = those stickers that have been given to me and if set H = those stickers I bought at the store, then is the union of G and H equal to my sticker collection? Are G and H disjoint?

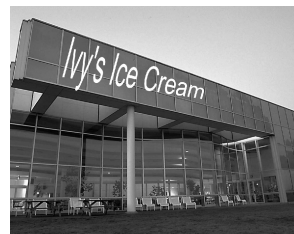
525. You and your best friend Jan head off to Ivy's Ice Cream. Ivy has 1,000 ice cream flavors. You like 600 of Ivy's flavors. Jan like 550 of Ivy's flavors.

Let set K = the flavors you like.

Let set L = the flavors Jan likes.

Must the union of K and L (known as  $K \cup L$ ) equal all of Ivy's flavors?

Must K and L be disjoint?



**Second part: the Mixed Bag: a variety of problems from this chapter and previous chapters**

659. Jan looked at the 1,000 flavors. One of them was anchovy–lamb with a ribbon of yam. Jan asked Ivy how she dreamed up all those 1,000 flavors of ice cream.

Ivy explained that she researched every ice cream store in the world and used every flavor she found.

Does this mean that the list of flavors that Ralph’s Three Flavor ice cream store and the list of flavors of Ivy’s Ice Cream are not disjoint?



727. Jan asked, “Do many people buy the anchovy-lamb with a ribbon of yam?”

Before Ivy could answer, Jan repeated:

**ANchoVY-LAMB With a RIBBON of YAM**      ♪    ♪  
**ANchoVY-LAMB With a RIBBON of YAM**  
 ♪    ♪      **ANchoVY-LAMB With a RIBBON of YAM**      ♪  
                          **ANchoVY-LAMB With a RIBBON of YAM**  
                                  **ANchoVY-LAMB With a RIBBON of YAM**

Jan broke out into song. She danced around in Ivy’s Ice Cream store. It was like watching a Hollywood musical, except that this was really happening. Jan is a very happy person, but she can sometimes be a little embarrassing to be around.

In the previous year only 4 customers had ordered anchovy-lamb with a ribbon of yam. Today, with Jan’s singing and dancing, 7 people got up the courage to order that flavor. Seven is what percent more than 4?

829. Ivy couldn’t believe the effect that Jan’s singing and dancing had on ice cream orders.

Ivy had the largest ice cream store in the world. She carried every flavor of ice cream known to mankind. And she was going broke.

As everyone in business knows, your profit equals your income minus your expenses.  $P = I - E$

Does a business owner want:  $I > E$ ,  $I = E$ , or  $I < E$ ?

922. You and Jan head off to Stanthony’s PieOne pizza place for lunch. You have a pepperoni pizza, a salad, a scoop of anchovy-lamb with a ribbon of yam on an ice cream cone and a half dozen other items. Name the one thing that you had that wasn’t once alive.

# Chapter Four

## Starting a Garden

### First part: Problems from this chapter

204. This last summer Jan was in a show. It went three weeks before it closed. Each night from 6 p.m. to 10 p.m. for 21 nights. “I made \$25 each night,” Jan told you. How much did Jan make in those three weeks?

207. Out of Jan’s paycheck the government took 20% in taxes. How much was left for the three weeks’ of work?

369. Jan had worked for four hours per night for 21 nights and had made \$420. Using conversion factors determine how much this actress made per hour.

Start with  $\frac{\$420}{\text{the whole job}}$

459. Each night Jan arrived at the theater at 6 p.m. The first 45 minutes were spent putting on stage makeup and getting into costume. After the performance itself, it took 30 minutes to take off the makeup and get out of the costume. We already know how much Jan was paid for those four hours. If you have ever done acting, you know that there were hours that Jan wasn’t paid for. What were they?

660. You are almost finished with your lunch with Jan at Stanthony’s PieOne pizza. Ivy rushes in. “I’m so glad I found you!” she exclaims. “Ever since you sang and danced at my ice cream store, I’ve had zillions of customers. The news got out. They came to see you. And they bought ice cream!”

Jan said, “I’m so happy to hear that.”

Ivy shouts, “You don’t understand. I’ll pay you \$200 an hour to do that **ANCHOR V-LAMB With a RIBBON of VAM** song and dance. You can set your hours—whenever you want.”


Jan winks at you as they leave to head to Ivy’s Ice Cream.

You think:  $\$200 \text{ per hour, } 40 \text{ hours per week, } 50 \text{ weeks per year.}$   
What would be Jan’s annual income?

Second part: the *Mixed Bag*: a variety of problems from this chapter and previous chapters

723. That afternoon the school newspaper broke the news.

## THE KITTEN Caboodle



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The Official Campus Newspaper of KITTENS UniversityWednesday 3:20 p.m. Edition 10¢

**exclusive**

### Jan Headlines at Ivy's

KANSAS: All of Kansas is talking about the new song-and-dance act at Ivy's Ice Cream store.

- Thousands have flocked to witness this ground-breaking advance in entertainment.
- Movie theaters have closed their doors.
- Classrooms are empty.
- Football games have been canceled.



—Ivy

"We also have ice cream for sale."

Everyone is talking about **anchoVv-LAMB With a RiBBoN of Vam**.

Ivy normally gets her hair done for \$30. After hearing about Ivy's success, her hairdresser increased Ivy's bill to \$35. What percentage increase was that?

830. In order to get into Ivy's and see Jan perform, you have to buy 6 cartons of **anchoVv-LAMB With a RiBBoN of Vam** and a \$5 plastic spoon. The whole package costs \$24.62.

How much does a carton of **anchoVv-LAMB With a RiBBoN of Vam** cost?

Here are some guidelines for solving "word problems" (as they are called in algebra).

- ① Let  $x$  equal the thing you are trying to find out. This means reading the problem and understanding the English. Often, looking for the question mark will be a good place to learn what is wanted.
- ② Write Then xxx equals yyy statements that depend on the Let  $x =$  statement you wrote in line ①.
- ③ After you have written several Then xxx equals yyy statements the equation will almost write itself.

150. Suppose I divide the entire physical universe into these two sets: Set A = everything that weighs less than 4 kilograms and Set B = everything that weighs more than 3 kilograms.

Is the union of A and B equal to the entire physical universe?

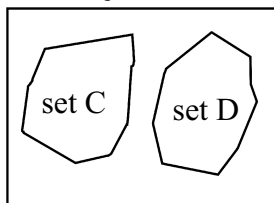
Yes. Every item in the physical universe must be in either set A or set B (or in both).

Are A and B disjoint?

No. There are items that are in both sets. For example, my breakfast pizza that I had this morning weighed 3.4 kilograms. It is in both sets.

*Discussion:* A kilogram weighs a little more than two pounds.

When you draw a Venn diagram of sets C and D and they are disjoint, it will look like this:

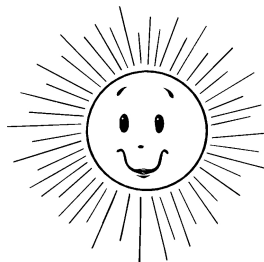


The sets C and D do not overlap. They have nothing in common.

151. Looking at wheat → mouse → cat → wheat → . . . we can think of it as a giant circle of life. The plants combine carbon dioxide and water and produce sugars, starches, and oils. Animals eat the sugars, starches, and oils and give off carbon dioxide. Like a wheel that it spinning, it would come to a stop unless something keeps it spinning. Where is energy inserted into this wheel of life?

In photosynthesis, carbon dioxide and water and *energy from the sun* are converted into sugars, starches, and oils.

It is the sun that spins the wheel of life.



152. You phoned her at 10 a.m. the next morning and woke her up. Jan had gone to sleep at 11:17 p.m. How long had she slept?

From 11:17 p.m. to midnight is 43 minutes.

From midnight to 10 a.m. is 10 hours.

She had slept 10 hours and 43 minutes.

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