

## Life of Fred Placement

*What fits your situation?*

**Your child hasn't learned the addition and multiplication tables cold.**

**When you ask, "Seven times eight?" they don't respond immediately with "56."**

*The Elementary Series was written for those who are not yet in at least the fifth grade.*

*Start with Life of Fred: Apples if your child does not know the addition tables cold.*

*Start with Life of Fred: Farming if your child does not know the multiplication tables cold.*

*Readers will receive a broad education in the ten books of the Elementary Series and the three books of the Intermediate Series.*

**Your child knows the addition and multiplication tables cold.**

*If you know the addition and multiplication tables cold and is in at the least fifth grade, then start with Life of Fred: Fractions. Your child will learn why it is important not to run while carrying an 18" knife.*

*There is no hurry! It would be a mistake to push kids into Life of Fred: Fractions before they are developmentally ready.*

*Students of normal academic ability and drive who begin Life of Fred: Fractions even in the 7th grade have a decent chance of starting college calculus (Life of Fred: Calculus) before the end of their high school years.*

**Your child knows all about arithmetic (fractions and decimals and percents).**

*There are many home schooling math curricula out there...some of them are so boring/repetitive that kids quickly forget anything they may have learned. Some of them are mathematically light-weight. The kids think that they have learned all of arithmetic. That is, until they hit their SATs or a college classroom. At that point they find out that there are big gaps in their knowledge.*

*With that in mind, let's see how much arithmetic your child has learned.*

*Here are some representative questions to ask your child. They are taken from Life of Fred: Fractions and Life of Fred: Decimal and Percents. Have them take out a piece of paper and play with these questions . . .*

*Each of these two books contains more material than their titles indicate. Here are some questions from these two books of the series. Have your child answer these questions and we'll see where in the series is the best place to start.*

- 1. Write 99 in Roman numerals. (from Life of Fred: Fractions, p. 74)*
- 2. What is the square of two and five-eighths? (Life of Fred: Fractions, p. 131)*
- 3. What is the inverse function to "multiply by six and then add twenty-four"? (Life of Fred: Fractions, p. 131)*
- 4. If a fence is 52" tall and it is made 40% higher, how tall would it be? (Life of Fred: Decimals and Percents, p. 137)*
- 5. Fred had 2100 books in his office. He lent 37% of them to students. How many books are still in his office? (Life of Fred: Decimals and Percents, p. 124)*

Here are the answers . . .

1. XCIX (not IC)
2.  $6\frac{57}{64}$
3. Subtract 24 and then divide by 6. (It is not Divide by 6 and then subtract 24.)
4. 72.8"
5. 1323 haven't been lent.

If we encounter difficulty with these questions and can, say, get only three (60%) of them correct, then I would suggest we begin with the first two books of the series: *Life of Fred: Fractions* and *Life of Fred: Decimals and Percents*.

Otherwise, it is time to move on to the gateway to high school mathematics.

Resist the temptation to plunge into high school algebra *Life of Fred: Beginning Algebra Expanded Edition* at this point.

The three books before beginning algebra were written to make the transition from arithmetic into high school algebra as smooth and as pleasant as possible:

- 1) *Life of Fred: Pre-Algebra 0 with Physics*
- 2) *Life of Fred: Pre-Algebra 1 with Biology* and then
- 3) *Life of Fred: Pre-Algebra 2 with Economics*.

Each takes about 40–50 days to complete.

These three books will cover important material that will be needed for beginning algebra. There is a strong emphasis on learning how to do word problems, which for many students is the hardest part of beginning algebra. They introduce a second method of attack for translating English into equations (called "six pretty boxes") that is not mentioned in the beginning algebra course.

Don't let the physics, biology, and economics bother you. Every *Life of Fred* book covers many different topics—not just math stuff. Consider the physics, the biology, and the economics as bonuses to enjoy. They will teach important things about physics, biology, and economics that most adults don't know.

## **Your student has completed the first year of high school algebra.**

Let's see how much first-year algebra your child has learned.

Here are some representative questions to ask your child. They are taken from *Life of Fred: Beginning Algebra Expanded Edition*. Have them take out a piece of paper and play with these questions:

1. What is the coefficient of  $34.7abc$ ? (page 68)
2. Army regulations require that their pickle relish use 10 pickles per pound of relish. In one giant bowl, the cooks have relish that only used 8 pickles per pound (too weak). In another bowl, they have relish that has 16 pickles per pound (too strong). They need to make 200 pounds of relish. How many pounds of each bowl should they use? (p. 170)
3. The point  $(a, b)$  is directly below  $(4, 9)$ . What can you say about  $a$ ? What can you say about  $b$ ? (p. 228)
4. The cooks at the army camp have four different dinner menus. In the next four days, how many ways could they serve them so every dinner will be different? (p. 273)
5. Solve  $\frac{1}{x-1} + \frac{1}{2} = \frac{2}{x^2-1}$  (p. 357)
6. Suppose there are two elements in the domain of some function and two elements in the range. How many possible functions could there be? (p. 492)

7. Solve  $48 - 3x > 36$  (p. 520)

Here are the answers . . .

1. 34.7

2. 150 pounds of the weak and 50 of the strong.

3.  $a = 4$  and  $b < 9$

4. 4! or 24

5.  $x = -3$  is the only answer. (not  $x = 1$ )

6. There are two possible functions.

7.  $x < 4$  (or  $4 > x$ )

If only 5 of the 7 are answered correctly (71%), then it would be silly to push into advanced algebra at this point.

Instead, start with *Life of Fred: Beginning Algebra Expanded Edition*. This will give your student a firm foundation for starting advanced algebra. These books will take the reader through beginning algebra in 104 daily lessons (the lessons aren't that long.) If some of the beginning algebra is remembered, two or three lessons might be done in a day. In any event, this pair of books will: (1) restore some fun into his view of mathematics; (2) fill in the holes left by other curricula; and (3) give the reader a sense of confidence rather than despair.

Given normal intelligence and reasonable work habits, your child will be through both *LOF: Beginning Algebra Expanded Edition* and *LOF: Advanced Algebra Expanded Edition* in 9 months and will not be "behind."

### Your student has completed the second year of high school algebra.

Let's see how much second-year algebra your child has learned. Here are some representative questions to ask your child. They are taken from *Life of Fred: Advanced Algebra Expanded Edition*. Have them take out a piece of paper and play with these questions . . .

1. What is the slope of the line that is perpendicular to  $y = (7/3)x - 5$ ? (p. 205 in *LOF:AA*)

2. Using Cramer's Rule solve for  $x$ :

$$x + y = 1$$

$$3x = 2y + 18 \quad (\text{from p. 282})$$

3. What is the equation of the ellipse whose vertices are (4, 5) and (10, 5) and which has a semi-major axis of length 1? (p. 334)

4. Let  $A$  and  $B$  be any two arbitrary sets. Suppose we have a function  $f:A \rightarrow B$  that is 1-1. What can we say about the number of elements in  $A$  compared with the number of elements in  $B$ ? (p. 386)

5. Resolve  $8/(x^2-4)$  into partial fractions. (p. 415)

6. What is the sum of the infinite geometric progression  $1/3 + 1/9 + 1/27 + 1/81 + \dots$ ? (p. 487)

Answers:

1.  $-3/7$



Radian Measurement:

degrees, minutes, seconds

sectors

conversions between degrees and radians

area of a sector ( $A = \frac{1}{2} r^2 \theta$ )

Conditional Trig Equations and Functions of Two Angles:

definition of a conditional equation

addition formulas

double-angle formulas

half-angle formulas

sum and difference formulas

product formulas

powers formulas

Oblique Triangles:

law of sines

law of cosines

Inverse Trig Functions:

using a calculator to find trig inverses

principal values of the arctan, arcsin and arccosine

the ambiguous case

Polar Coordinates:

Cartesian coordinates

graph polar equations

converting between Cartesian and polar coordinates

the polar axis and the pole

symmetry with respect to a point and with respect to a line

Polar Form of Complex Numbers:

$r \operatorname{cis} \theta$  means  $r(\cos \theta + i \sin \theta)$

de Moivre's theorem

proof of de Moivre's theorem

the five answers to fifth root of 1

2. Offer six (optional) chapters which "Look Back" to the important topics in algebra.

For example, the sixth of those Looking Back chapters covers:

Functions

1-1, onto

domain, codomain

1-1 correspondence

the definition of the number 1

natural numbers

the definition of the number zero

whole numbers

rational numbers

irrational numbers

transcendental numbers

natural logarithms and common logarithms

*e*

*real numbers*

*algebraic numbers*

*pure imaginary numbers*

*complex numbers*

*the complex number plane*

*$i$  to the  $i$ th power is a real number ( $\approx 0.2078796$ )*

3. *Offers a Looking Forward to the two years of calculus and examines each of the 24 chapters in Life of Fred: Calculus and describes what parts of high school math will be required. It provides exercises for each of the topics.*

**Your student has completed four years of high school math (including two years of algebra, a year of geometry and trigonometry).**

*College calculus is next! Life of Fred: Calculus will offer a joyful romp through college freshman and sophomore calculus.*

*All the traditional calculus topics are covered, including first and second order differential equations.*

*As with all of the Life of Fred books, things happen first in Fred's life, he needs a particular piece of math, and then we teach the math. Every part of calculus is motivated by real life.*

*In addition to the usual calculus topics, there is a "Further Ado" section at the end of the book (75+ pages) that includes many topics that are often not found in many lower division calculus books.*

*For example:*

*The proof of: If  $f:A \rightarrow B$  and  $g:B \rightarrow A$  are two 1-1 functions, then there exists a function  $h:A \rightarrow B$  that is both 1-1 and onto*

*The formal definition of limit.*

*Proofs of the Product Rule; the Quotient Rule; the Chain Rule; Rolle's Theorem; the Mean Value Theorem; and the Fundamental Theorem of Calculus.*

*The Parametric Form for Integrals.*

*An introduction to programming in BASIC.*

*Nine-dimensional vector spaces.*

*Lagrange Multipliers.*

*Green's theorem, Gauss's theorem, and Stokes's theorem.*