Teaching Chapter 5

Although this is a short chapter, I consider it central to understanding how a calculator can process numbers. You may recall that I indicated my astonishment when I was shown that first Hewlett-Packard calculator and saw that it could give an answer for $2.356^{3.71}$. It is one thing to have the calculator represent what is to be found in tables like cosines and logarithms, but this keying carried out a unique operation, an operation that, as I showed in Chapter 1, would have taken me five to ten minutes to carry out with paper and pencil. And then with less accuracy.

What Kepler and Newton and Euler and the Bernoullis would have given for this kind of power. It would have saved them quite literally months of calculations.

So, although the chapter is short and is focused on one task, which turns out to be remarkably straightforward, it is important and I hope that you will impress this on your students.

Here then are some of the things you will want to accomplish in Chapter 5:

1. Processing exponents is important not only in this chapter but in the next on logarithms as well so it will be useful for you to review this. I have included some exercises that should prove useful for this.

2. It is important to have your students see how the square root key, $\sqrt{\phantom{0}}$, which we "programmed" in Chapter 4, is now a useful tool in addressing further problems.

3. Although most students today have been exposed to binary integers, not nearly as many have worked with binary numbers between zero and one. This is an appropriate time to review and extend binary representation and conversion between decimal and binary.

4. Both programs of this chapter are important as they illustrate both binary processing and some associated shortcuts. I urge you to go over them both with care.