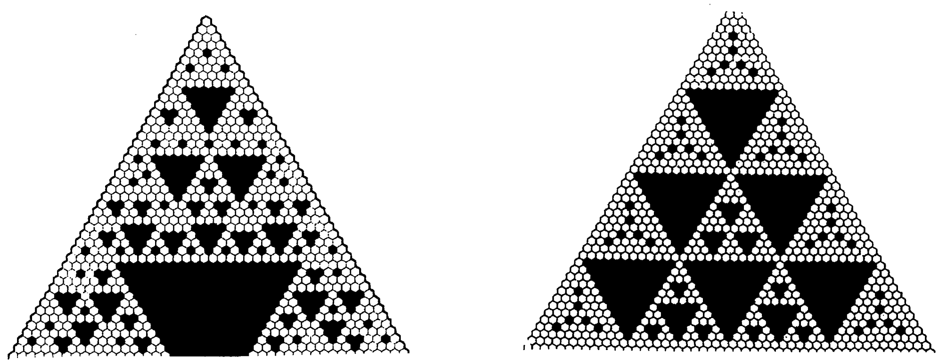

**Figure 4.** Entries divisible by 6 are shaded in Pascal's triangle (left) and the Fibonomial triangle (right).

*Acknowledgments.* The original catalyst for this project was a problem proposed by Stephen B. Maurer at a workshop organized by Marvin Brubaker on discrete mathematics at Messiah College in June 1992. We thank a referee for correcting a formula.

## References

1. M. Bicknell and V. E. Hoggett, *A Primer for the Fibonacci Numbers*, Fibonacci Association, San Jose, CA, 1972.
2. T. A. Brennan, Fibonacci powers and Pascal's triangle in a Matrix, Part I, *Fibonacci Quarterly* 2 (1964) 93–103.
3. T. M. Green and C. L. Hamberg, *Pascal's Triangle*, Dale Seymour Publications, Palo Alto, CA, 1986.
4. V. E. Hoggett, *Fibonacci and Lucas Numbers*, Houghton Mifflin, Boston, MA, 1969.
5. R. Johnsonbaugh, *Discrete Mathematics*, Macmillan, New York, 1990.
6. S. B. Maurer and A. Ralston, *Discrete Algorithmic Mathematics*, Addison-Wesley, Reading, MA, 1991.
7. D. Seymour, *Visual Patterns in Pascal's Triangle*, Dale Seymour Publications, Palo Alto, CA, 1986.

——— o ———

## A Discover-*e*

Helen Skala (skala@math.uwlax.edu), University of Wisconsin–La Crosse, La Crosse, WI 54601

Here is a simple but interesting discovery problem for calculus students who have learned to differentiate exponential functions. Distribute a printout of the graphs of four to six exponential functions for various bases (Figure 1). The students will place a straightedge through the origin and rotate it until it is tangent to one of the curves, then draw the tangent line and mark the point of tangency. Have them do this for each curve (Figure 2).

The points of tangency seem to lie on a horizontal line. Ask your students to prove this conjecture.

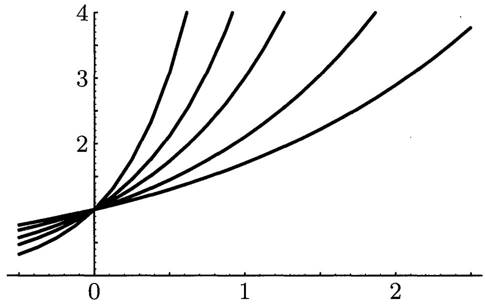


**Figure 1.** $y = 1.7^x$, $2.1^x$, $3^x$, $4.5^x$, $9.5^x$.

To do so, use differentiation to find the point of tangency, which, for the function $y = a^x$, is $\left(1/\ln(a), a^{1/\ln(a)}\right)$. But from properties of logarithms, it follows that $a^{1/\ln(a)} = e$ for any value of $a \neq 1$. Hence the points of tangency do indeed lie on a horizontal line, namely, the line $y = e$.

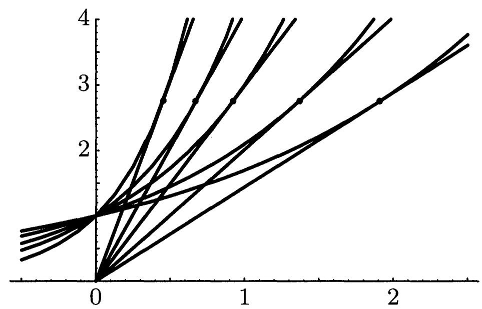


**Figure 2.** Points of tangency.

———— o ————

## A Concurrency Theorem and *Geometer's Sketchpad*

Larry Hoehn (hoehnl@apsu01.apsu.edu), Austin Peay State University, Clarksville, TN 37044

Draw an arbitrary $\triangle$ABC inside a circle, extend the sides to meet the circle, and join these points to vertices of the triangle as shown in Figure 1. The resulting lines AQ, BR, and CP always appear concurrent.

With the software *Geometer's Sketchpad* the sketch is considerably improved. All of the figures in this article were constructed by using *Sketchpad*. Not only does *Geometer's Sketchpad* allow quicker, easier, and more accurate "straightedge and compass" constructions, but it also allows these sketches to be transformed in all sorts of dynamic ways.