Mathematics 1101Y – Calculus I: functions and calculus of one variable
Trent University, 2010–2011

Assignment #3
Some poetical mathematics
Due on Friday, 22 October, 2010.

Indian mathematicians wrote up much of their work in verse. For example, here is a problem* posed by Bhaskara† (*c.* 1114-1185 A.D.) in a book dedicated to his daughter Lilavati:

> The square root of half the number of bees in a swarm
> Has flown out upon a jasmine bush;
> Eight ninths of the swarm has remained behind;
> And a female bee flies about a male who is buzzing inside a lotus flower;
> In the night, allured by the flower's sweet odour, he went inside it
> And now he is trapped!
> Tell me, most enchanting lady, the number of bees.

For those interested in the history of mathematics, Bhaskara developed a number of techniques based on infinitesimal analysis that anticipated portions of both differential and integral calculus.

1. Restate the problem given above as an equation. *[4]*

2. Solve the equation you obtained in **1** by hand. *[3]*

3. Solve the equation you obtained in **1** using `Maple`. *[3]*

Bonus. What does Bhaskara's problem have to do with a *Monty Python* sketch? *[1]*

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*   This translation of Bhaskara's problem is given in *The Heritage of Thales*, by W.S. Anglin & J. Lambeck, Springer Verlag, New York, 1995, ISBN 0-387-94544-X, p. 113.

†   There was another important Indian mathematician also named Bhaskara (*c.* 600-680 A.D.), just to confuse the issue.