Quiz 4

MA 123 A2, Summer I 2010

This quiz is closed-books and closed-notes. No calculators or cellphones are allowed. There are 2 problems, all together worth 10 points.

Problem 1 (5 points)**.** A Hollywood company budgeted 25 million USD to advertize a new movie. The market research provided empirical data suggesting that spending x million USD on Cable TV ads will result in $3\sqrt{x}$ million additional viewers, while spending y million USD on Internet ads will result in $4\sqrt{y}$ million additional viewers. How much money should be allocated for TV and Internet ads respectively in order to maximize the number of additional viewers?

Problem 2 (5 points)**.** Egyptians are building a pyramid with a square base and the top right above the center of the base (see picture). If the volume of the pyramid increases at the constant rate of 10000 ft^3/day, find the rate of change of the height when the height is 10 ft, and also when the height is 100 ft.

Recall that the volume of a pyramid is

$$V = \frac{Bh}{3},$$

where B is the area of the base and h is the height of the pyramid.