Math 112
Wednesday, February 1, 2008
A Question of Carpeting

Dear Calculus students,

I recently became CEO of a large corporation (after a somewhat messy, hostile take-over), and do not yet trust anyone in the company to assist with critical decisions necessary for the success of the corporation. For example, I am remodeling my oval office and replacing the terrible orange carpeting left behind by my predecessor. With the Board and shareholders watching my every move, I want to be careful not to appear profligate. I have already decided on a tasteful aqua shag, but the carpeting comes on rolls in three different widths: 2.5 yards wide, 1.5 yards wide, and 1 yard wide.

I will use the same width for the entire office, but I'm not sure which one to choose. Once I choose a width, I can order as many strips in that width as I want, and I can specify the length of each strip. For each width, I need an analysis of how many square feet of carpeting I must buy, and an estimate of the amount of carpeting that will be trimmed and wasted.

I also have the option of special ordering the carpet in any width. To impress the board with my thoroughness, creativity, and all-around brilliance, I would like to know what width to order so that no more than 30 square feet are wasted, and what width to order so that no more than 10 square feet are wasted.

To assist in your calculations, I am including a sketch of my office. Thank you in advance for your time and diligence on this important matter.