

Rockhurst University Mathematics Problem of the Month

The contest is open to any currently enrolled Rockhurst student. The winner will be chosen according to who has the best solution (not just answer) to the problem. Ties will be resolved by considering the order in which the solutions were received.

Solutions should be submitted to Keith Brandt (Richardson 120) by the end of the month. Winners receive wonderful prizes, so give these problems some thought!

Problems for September 2006:

1. A conical pile of a hazardous material emits toxic fumes at a rate proportional to its surface area. Thus engineers responsible for storage and ventilation of such a pile must know a relationship between the surface area A (not including the bottom) and volume V of a cone. Assume that for a particular material, the conical pile will have height equal to the radius of its base. Find a relationship between A and V .
2. Consider sums of positive whole numbers that add up to 13. For example, you could write $4 + 9 = 13$ or $2 + 5 + 6 = 13$. Now multiply these numbers together. In the two examples above, we would have $4 \cdot 9 = 36$ and $2 \cdot 5 \cdot 6 = 60$. What is the largest product that can be produced this way?