

## The Holiday Puzzle

### THIS YEAR: A DISK PACKING PROBLEM

Suppose you have  $n$  disks each of radius 1 where  $n$  is a positive integer. You place them inside a rectangle so that no two disks overlap except possibly at a tangent point. The disks may also be tangent to the rectangle. Consider the ratio whose numerator is the sum of the areas of the disks and whose denominator is the area of the rectangle. Is there a value of  $n$  and a rectangle so that this ratio is strictly greater than  $\pi/4$ ? If not, describe why not. If so, give an example of these  $n$  disks and a rectangle; try to make the value  $n$  in this example be as small as you can find.

On GROUNDHOG DAY, 2008, solutions will be announced and will be posted on the Web at

<http://math.albany.edu/~martinhi/puzzle.html>

Send solutions to:

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