

# Problem for 2001 August

Proposed by Dan Jurca

The elf problem

The following problem has appeared before, but not recently.

a.

In a certain house there are 100 pounds of gold dust. One night elves sneak into the house and steal 1% of the gold, and leave the remaining 99%. The next night the elves return and steal 2% of the gold, and leave the rest. The next night the elves return and steal 3% of the gold, and leave the rest. This continues until the 100th night, when the elves finally steal 100% of the gold, leaving none. On which night did the elves steal the most gold?

b.

Generalize; that is, suppose that  $n$  is a positive integer, and that for  $i$  between 1 and  $n$ , inclusive, on the  $i$ -th night the elves steal  $i/n$  of something, leaving the rest. On which night do the elves steal the most?