The first two steps of the development of a dynamic programming algorithm for a problem are

**step 1** define the subproblem

**step 2** find a recurrence for the optimal value of the subproblem in terms of smaller subproblems

Perform just these two steps for this (and the next two) problems. Do not write (pseudo) code - just the subproblem and recurrence structure:

Your company is hired by the WA state highway agency to place warning signs along a dangerous road. On that road are $n$ locations at which you may place a sign, at mile posts $m_1 < m_2 < \cdots < m_n$, where each $m_i$ is measured from the starting point $m_1 = 0$. The only places you are allowed to place a sign are at one of the given mileposts. In addition, you must place one at locations $m_1$ and $m_n$. (If $n = 1$ then you just place one at $m_1$.)

The requirement is to place one every 50 miles, but this may not be possible (depending on the spacing of the mileposts). If you place two consecutive signs $x$ miles apart, the penalty for that placement is $(50 - x)^2$ which will be deducted from your payment. You want to arrange a placement so as to minimize the total penalty - that is, the sum, over all locations, of the penalties. Perform the two steps above to start the process of determining the minimum possible penalty.