MATH 120A

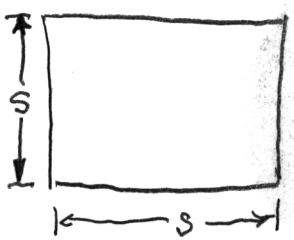
Quiz 8

2006 Sep 27

Name:_____ Score:_____

Solve the following problem, and show your analysis, which should include (1) quantities involved (expressed in a list, a table, and/or a diagram), (2) pseudocode preliminary, (3) clearly identifying what the unknown represents.

A square vegetable garden is to be tilled and then enclosed with a fence. If the fence costs \$1 per foot and the cost of preparing the soil is \$0.50per square foot, determine the size of the garden that can be enclosed for \$120.



Cost to fence/ft = \$1
Cost to till/ft^2 = \$0.50
Total cost = \$120

Total cost = cost to fence + cost to till

Cost to fence = (cost/ft)(no. of ft) = (1)(4s) = 4s
Cost to till = (cost/ft^2)(area) = (.5)(s^2)

$\therefore 120 = 4s + .5s^2$

$.5s^2 + 4s - 120 = 0$

$s^2 + 8s - 240 = 0$

$$s = \frac{-8 + \sqrt{8^2 - 4 \cdot 1(-240)}}{2 \cdot 1} = \frac{-8 + \sqrt{1024}}{2} = \frac{-8+32}{2} = \frac{24}{2}$$

$= \boxed{12}$

Check: cost to fence = \$1·(4·12) = \$48
cost to till = \$0.50(12^2) = \$.50(144) = \$72
Total cost = \$48 + \$72 = \$120