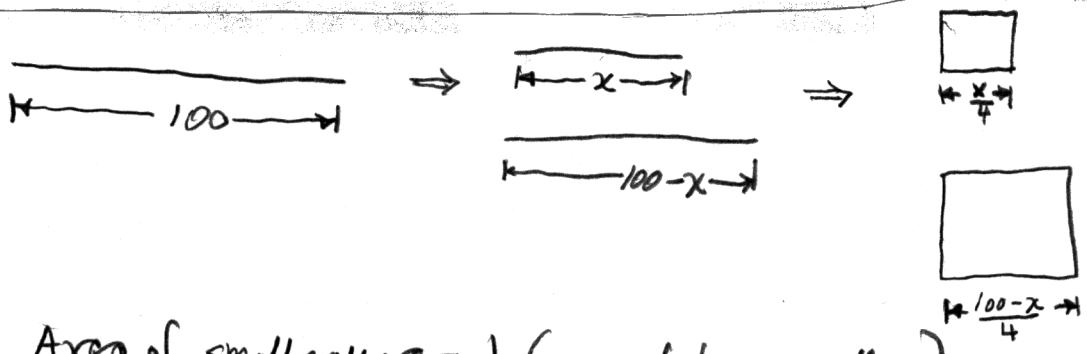
MATH 120A

Quiz 5

Name: ANSWER KEY Score: _____

Set up the equation only for the following problem. DO NOT SOLVE THIS EQUATION. (1) List the quantities involved, indicating those whose values are known and those which are sought. (2) Write a preliminary analysis in pseudocode, diagram or table. (3) Clearly identify what your unknown represents.

Two square wire frames are to be constructed from a piece of wire 100 inches long. If the area enclosed by one frame is to be one-half the area enclosed by the other, find the dimensions of each frame. (Disregard the thickness of the wire.)



Area of small square = $\frac{1}{2}$(area of large square)

$$\left(\frac{x}{4}\right)^2 = \frac{1}{2}\left(\frac{100-x}{4}\right)^2$$

Alternative approach Let s = side of larger square (in inches)

Since Area of smaller square = $\frac{1}{2}$(area of larger square)

$= \frac{1}{2}s^2 = \left(\frac{s}{\sqrt{2}}\right)^2$

it follows that side of smaller square = $s/\sqrt{2}$.

Perimeter of smaller square + perimeter of larger square = 100

$$4s + 4\left(\frac{s}{\sqrt{2}}\right) = 100$$