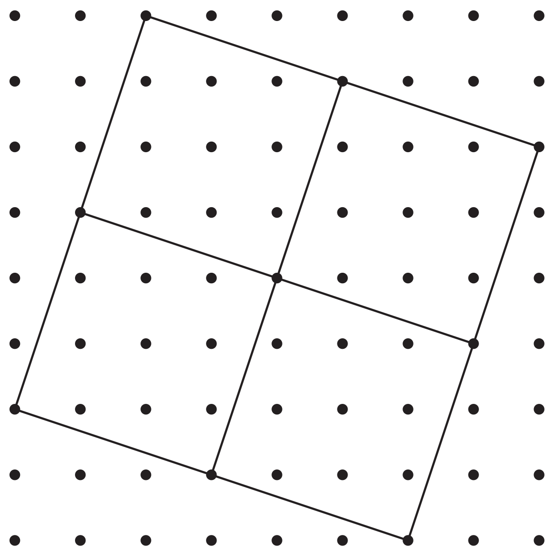
LAB 9.3
Simplifying Radicals

Name(s) ____________________

■ **Equipment:** Geoboard, dot paper



1. In the above figure, what are the following measures?

a. The area of one of the small squares

b. The side of one of the small squares

c. The area of the large square

d. The side of the large square

2. Explain, using the answers to Problem 1, why $\sqrt{40} = 2\sqrt{10}$.

3. On the geoboard or dot paper, create a figure to show that $\sqrt{8} = 2\sqrt{2}$, $\sqrt{18} = 3\sqrt{2}$, $\sqrt{32} = 4\sqrt{2}$, and $\sqrt{50} = 5\sqrt{2}$.

4. Repeat Problem 3 for $\sqrt{20} = 2\sqrt{5}$ and so on.

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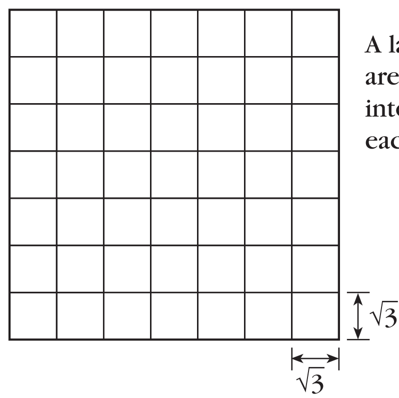
Simplifying Radicals (continued)

In the figure on the previous page, and in the figures you made in Problems 3 and 4, a larger square is divided up into *a square number of squares*. This is the basic idea for writing square roots in *simple radical form*. The figure need not be made on dot paper. For example, consider $\sqrt{147}$. Since $147 = 3 \cdot 49$, and since 49 is a square number, we can divide a square of area 147 into 49 squares, each of area 3:



A large square with area = 147 divided into 49 small squares each with area = 3

If you pay attention to the sides of the figure, you will see that $\sqrt{147} = 7\sqrt{3}$. Of course, drawing the figure is not necessary.

5. Write the following in simple radical form.

a. $\sqrt{12}$

b. $\sqrt{45}$

c. $\sqrt{24}$

d. $\sqrt{32}$

e. $\sqrt{75}$

f. $\sqrt{98}$

Discussion

A. Draw a figure that illustrates $4\sqrt{5}$ as the square root of a number.

B. Explain how to use a number's greatest square factor to write the square root of that number in simple radical form. Explain how this relates to the figure above.