

**Project: Constructing a Dance Floor**

For use with Chapter 4

**OBJECTIVE** Design a dance floor with a mosaic pattern.**MATERIALS** ruler, graph paper, protractor, scissors, glue

**INVESTIGATION** You work for a construction company. One of the clients wants the company to build a 16 foot by 20 foot dance floor. They want the floor to be a mosaic pattern made up of congruent triangles. Your boss wants you to design the floor and determine the cost. You spoke with the client, and they agreed to let you use a few quadrilaterals in addition to the congruent triangles. However, they want the triangles to be at least 50% of the design, they want at least 30 congruent triangles with at least two differently shaped triangles, and they don't want the largest dimensions of any quadrilateral to be more than 3 feet by 3 feet. They understand the cost of the dance floor will be based on the shapes that you use.

**Constructing the Floor** You decide to model the floor design using an 8 inch by 10 inch piece of graph paper. Your work can be approached in several ways. Two possibilities are given here.

- A. You can draw a design on the graph paper and do the needed calculations to be sure you meet the client's specifications.
- B. You can cut the piece of graph paper into as many pieces as you want, using at least 50% of the paper for the congruent triangles, and reassemble them to form an interesting pattern. The shapes need to be reassembled to form an 8 inch by 10 inch rectangle.

**Determining the Cost** The client likes your design, but wants to be assured you followed their specifications. They agree to pay the flooring bill but will check it carefully to make sure it matches the design.

1. Make a table of all the shapes you used. For each shape include the quantity you used, the individual area, and the total area.
2. Provide additional calculations to convince the client that congruent triangles cover at least 50% of the flooring.
3. Write an organized and detailed bill for the client. Include the amount for tax, using the current tax rate for where you live.

The cost of the flooring is based on the shapes as follows:

\$5.35 for any scalene triangle	\$4.00 for squares
\$4.50 for rectangles	\$7.60 for any other quadrilateral
\$3.75 for equilateral or isosceles triangles	

**PRESENT YOUR RESULTS** Your report to your boss should include all the paperwork and calculations done for your client: a final plan of the floor design, a table of data about the shapes used, and an itemized bill. Your boss also wants a summary of your work effort. Explain the approach you used. Describe what was easy or difficult about working for this client and whether you would like to work on a similar project again.