Euclid's Tile Solution

One possible solution:

Since the floor measures 14 feet by 17 feet, it would measure 168 inches by 204 inches.

The tiles are 9-inch square. Since neither 168 nor 204 are evenly divisible by 9, some of the tiles must be cut in order to tile the floor.

When you divide 168 by 9, it divides 18 times with a remainder of 6. Therefore the width of 14 feet (168 inches) would require 19 tiles.

When you divide 204 by 9, it divides 22 times with a remainder of 6. Therefore the length of 17 feet (204 inches) would require 23 tiles.

The total number of tiles laid in this manner would be 19×23=437 tiles. This assumes that the cut tiles are laid against two walls.

A second possible solution:

Assume that the tiling began in the middle of the room. Then cut tiles would be placed on all four walls.

You could lay 18×22, or 396, whole tiles on the floor. Then along each wall you would have partial tiles. The shaded section represents the partial tiles. If each partial tile was cut from a full tile, you would need 20 tiles for the left border, 20 tiles for the right border, 22 tiles for the top border and 22 tiles for the bottom border. Adding these to the 396 whole tiles would require a total of 480 tiles.