

Miguel's Party Planning

Miguel's daughter, Ariceli, is turning 15 years old in a few months, and so he and his family are planning a Quinceañera in her honor. To begin the process, Miguel called a local hotel to reserve the largest room available for the party.

5 "My name is Ronald, and I will be assisting you with this reservation, sir. We have three rooms available that may fit your needs. Just so you know, all of our rooms are polygonal and have four sides." stated the hotel representative.

"Oh, that's great to hear, Ronald!" Miguel responded. "Tell me more about these rooms, so that I can figure out which one will have the most floor space for my daughter's party."

10 "Okay, sir," answered the hotel rep. "Here they are. Our Pacific Room, again, has four sides with lengths of 40 feet, 60 feet, 40 feet, and 60 feet. Our Atlantic Room has side lengths of 50 feet on every side. Our Arctic Room has all side lengths of 50 feet as well."

15 "Hmm," Miguel pondered. "It sounds to me that all the rooms have perimeters of 200 feet. I think I can determine the floor space for these rooms, but I need a little more information. Let's start with the Pacific Room. I think this room could be in the shape of either a kite or a parallelogram. Would you tell me about the angles of the walls?"

"Sure, sir," the hotel rep said. "Give me one moment to check this out with my manager."

20 As he waited, Miguel reviewed the dimensions of the other two rooms as well. "Both the Atlantic and Arctic Rooms are rhombi, but I wonder if one or both are squares? If at least one of the rooms were a square, then the floor space would be 2500 square feet. Man! I should have asked the representative to find out the angles for these rooms, too!" Miguel thought to himself. He paused for a moment, and then exclaimed, "I need more information!"

At that moment, Ronald returned, and said, "So sorry to have kept you waiting, sir."

25 "Oh, no problem, Ronald. It gave me the chance to go over the rest of the room information that you gave me," Miguel responded. "What did you find out?"

"Well, sir, the Pacific Room has all right angles, with the 40-foot sides opposite each other and the 60-foot sides opposite each other as well," the hotel rep stated.

"Great!" replied Miguel, "That sounds like a rectangle to me."

30 "I believe you're correct, sir," Ronald responded. "I found out more information about the other rooms as well. Would you like to hear it?"

"Absolutely!" said Miguel, "You read my mind!"

“Great!” answered Ronald. “So continuing with the Atlantic Room, it has a pair of opposite angles that measure 120° and the other pair of opposite angles measure 60° . For the Arctic Room, all of the angle measures are 90 degrees. Does this all make sense to you?”

35 “It sure does, Ronald” responded Miguel. “Give me a few moments to calculate the areas of the floor space in each room, and I will call you back and let you know which room to reserve for my daughter’s party.”

“That sounds great, sir,” Ronald replied. “My direct extension is 4423. Feel free to call me if you have any more questions.”

40 “Will do, Ronald. Thank you for your help so far.”

“You’re welcome, sir. We look forward to helping you with your daughter’s party. Good bye.”

Miguel took his notepad on which he had written all the room information and went to his desk to determine the largest room and make his decision. After a little while, Miguel called
45 Ronald back...

“Hello, this is Ronald. How may I help you?”

Which room should Miguel choose?