

**Solution:**

The United States Botanic Gardens.

First, construct a diagram with which to apply the rules. The background information shows there are three circular layers and 17 flowers arranged on rings of each layer. Rules 3 and 6 let us know how many flowers there are on each layer.

**3. There must be three flowers on the top tier.**

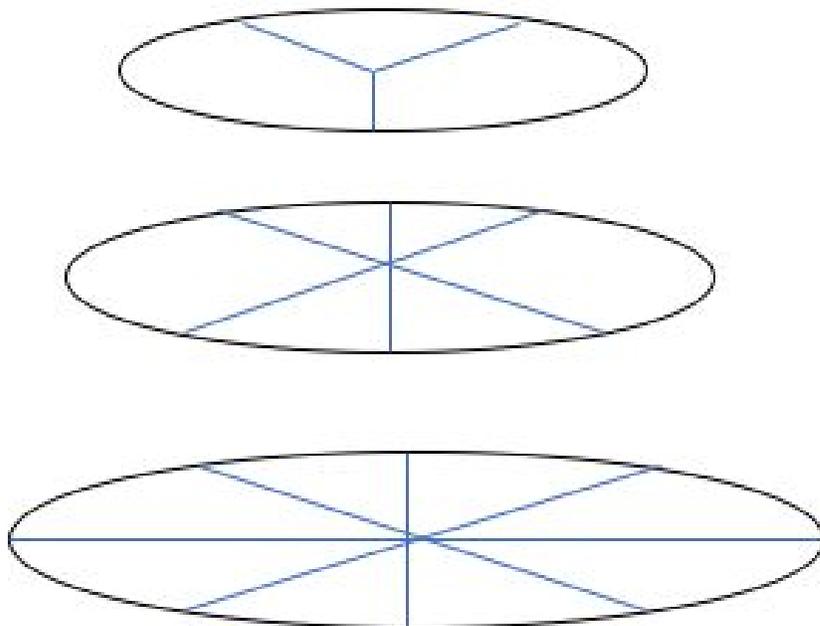
**6. The middle tier must have double the number of flowers on the top tier.**

The top layer has 3 flowers.

If the middle layer has double the number of the top layer, and  $3 \times 2 = 6$ , then the middle layer has 6 flowers.

Thus, because  $17 - 9 = 8$ , the bottom layer has 8 flowers.

The diagram should look something like the image below. This diagram represents three layers of cake with spaces for the correct number of fondant flowers.



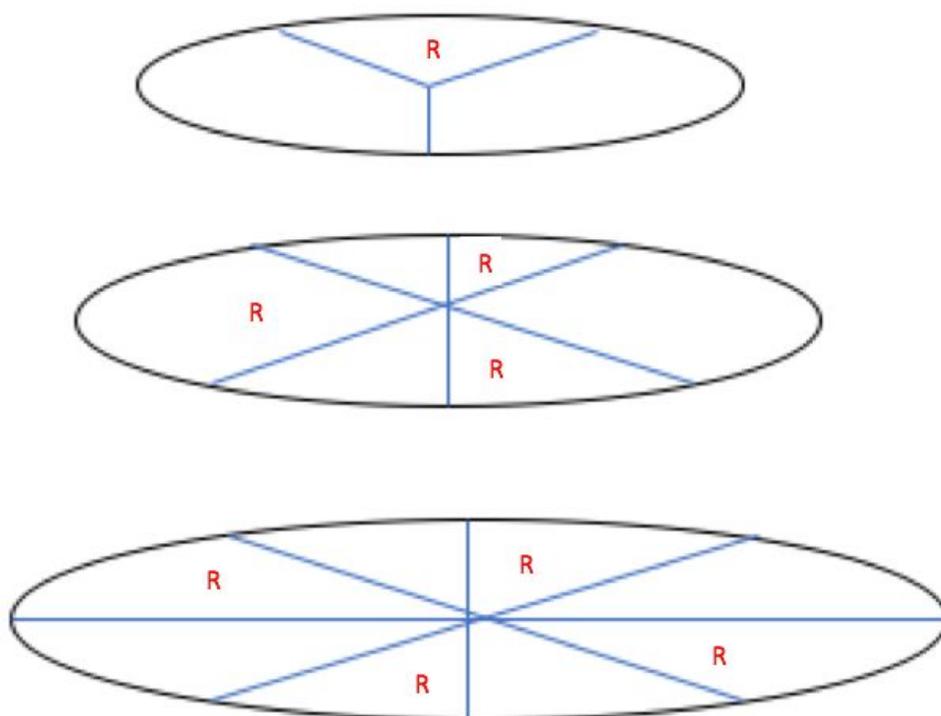
The next step is to determine which of the rules provide fixed information. Turn to Rule 8 and Rule 5.

**8. There are as many roses on the whole cake as there are flowers on the bottom tier.**

Because there are 8 flowers at the bottom tier, there must be 8 roses on the cake.

**5. No two roses can be placed next to each other.**

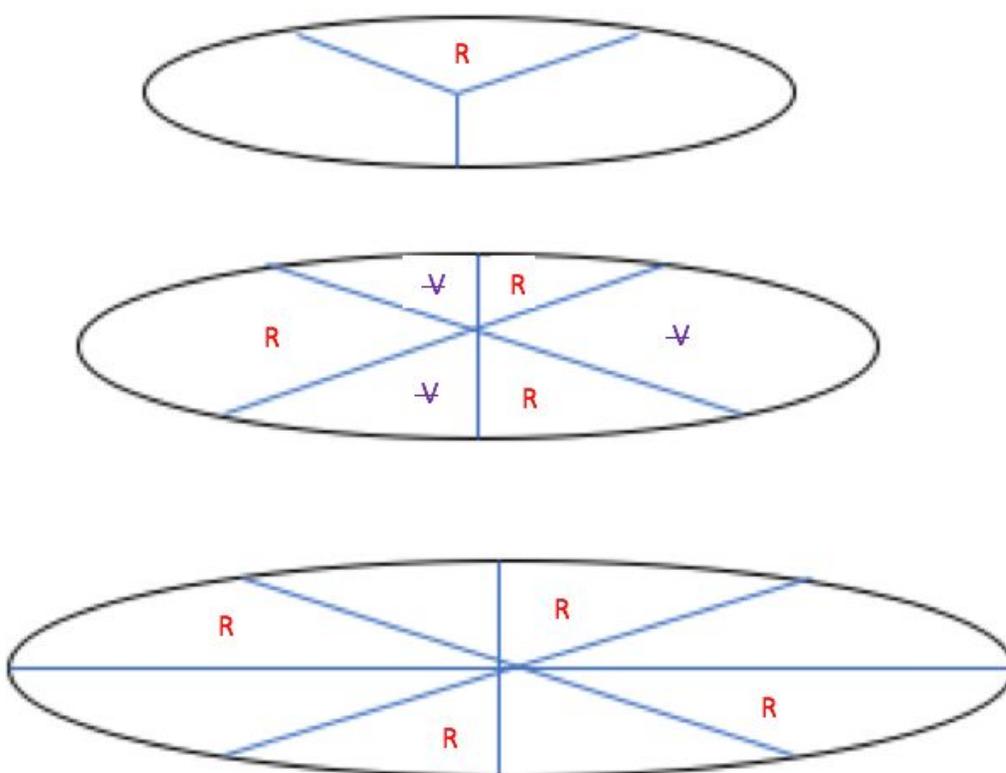
If there are 8 roses, but no two roses can be placed next to each other, and more than half the fondant flowers are roses, then it is possible to determine how many roses are on each tier. Half of the middle and bottom tiers must be roses, and one of the flowers on the top tier must be a rose. None of the roses can be placed next to each other. The diagram should look like this.



Now, look at Rule 2.

**2. Violets cannot be directly across from roses.**

There are no spaces for flowers across from roses on the top tier, because there are only three spaces. The roses on the bottom tier are all directly across from one another. However, all the available spaces in the middle tier are directly across from roses. This means that no violets can be placed on the middle tier.



Let's now examine rule 7.

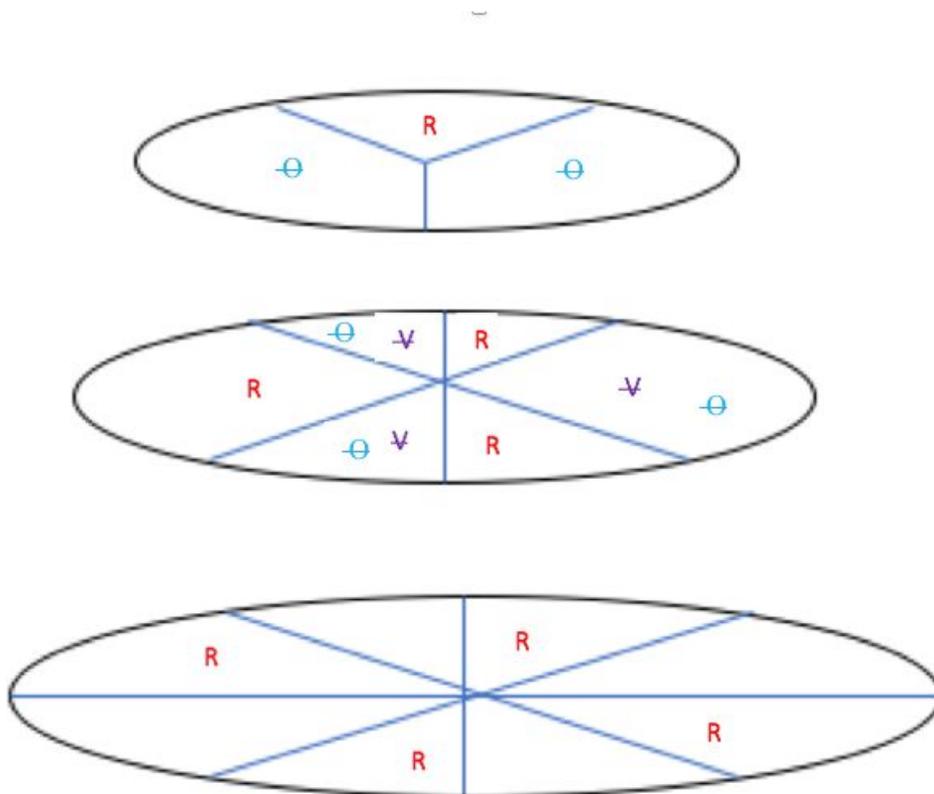
**7. If there is an orchid on a tier, there must also be at least one violet on that tier.**

The contrapositive is: if there is not a violet on a tier, then there is not an orchid on that tier. Because there can be no violets on the middle tier, there can also be no orchids. Mark the diagram accordingly.

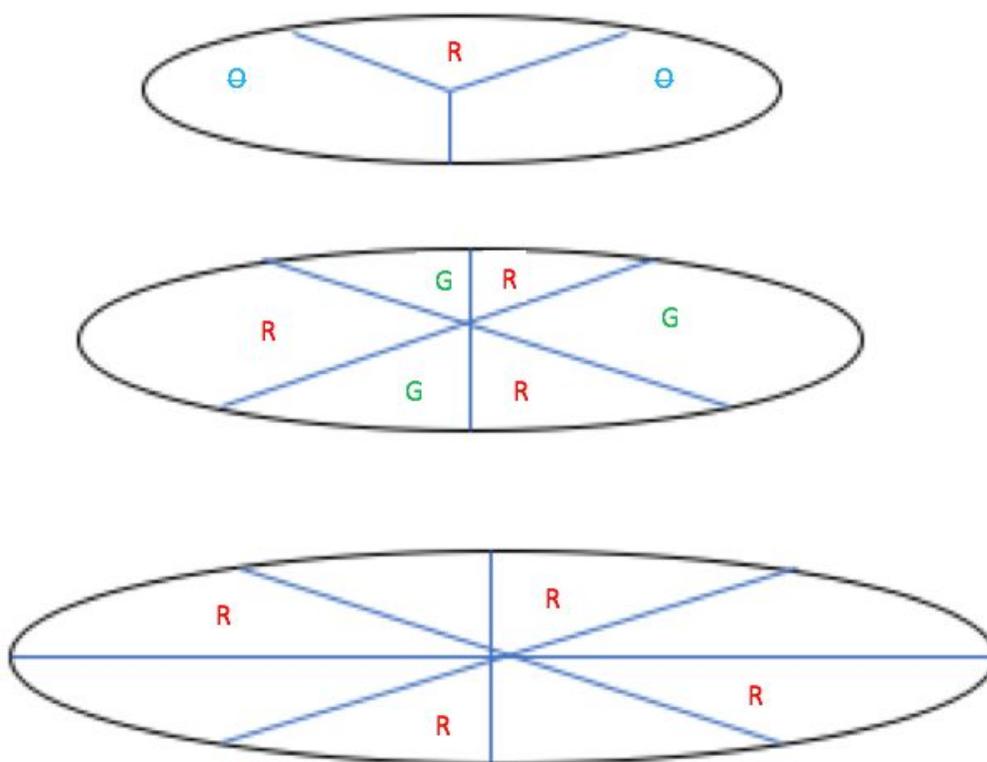
Rule 7 also prevents orchids from being an option on the top tier. There are only three spaces available on the top tier. One is a rose. If one of the flowers was an orchid, the remaining space must be a violet. However, this would break Rule 4.

**4. No geraniums can be on a tier lower than any orchids.**

Thus, orchids cannot be on the top tier.



Furthermore, if no violets or orchids are allowed in the available spaces on the middle tier, then those spaces must be occupied by geraniums.



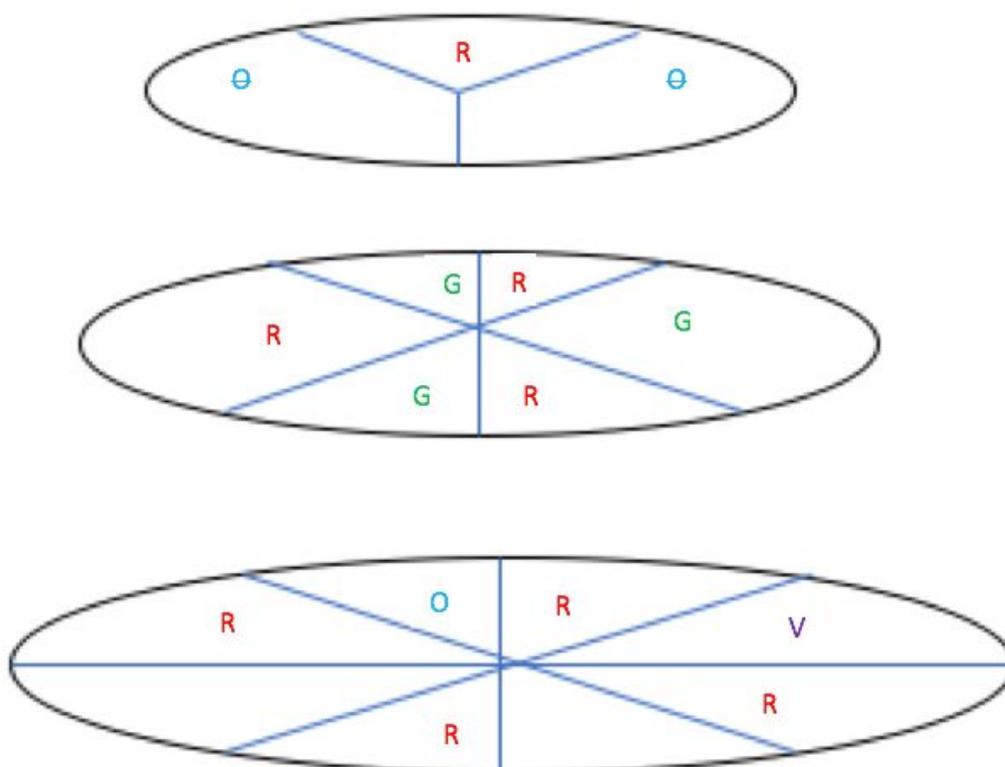
The background information clearly states that: at least one of each type must be on the cake. This means that there must be at least one orchid on the bottom tier. Rule 6 dictates that if there is an orchid, there must also be a violet. Thus, there is at least one violet flower on the bottom tier.

Turn to Rule 9.

**9. If there are more violets than geraniums, then the wedding venue is the National Mall. Otherwise, the wedding venue is the United States Botanic Gardens.**

Because of the available spaces, it is not currently possible to determine the exact number of violets or geraniums. At this point, the venue could be the United States Botanic Gardens or the National Mall. Thus, Rule 9 does not yet apply.

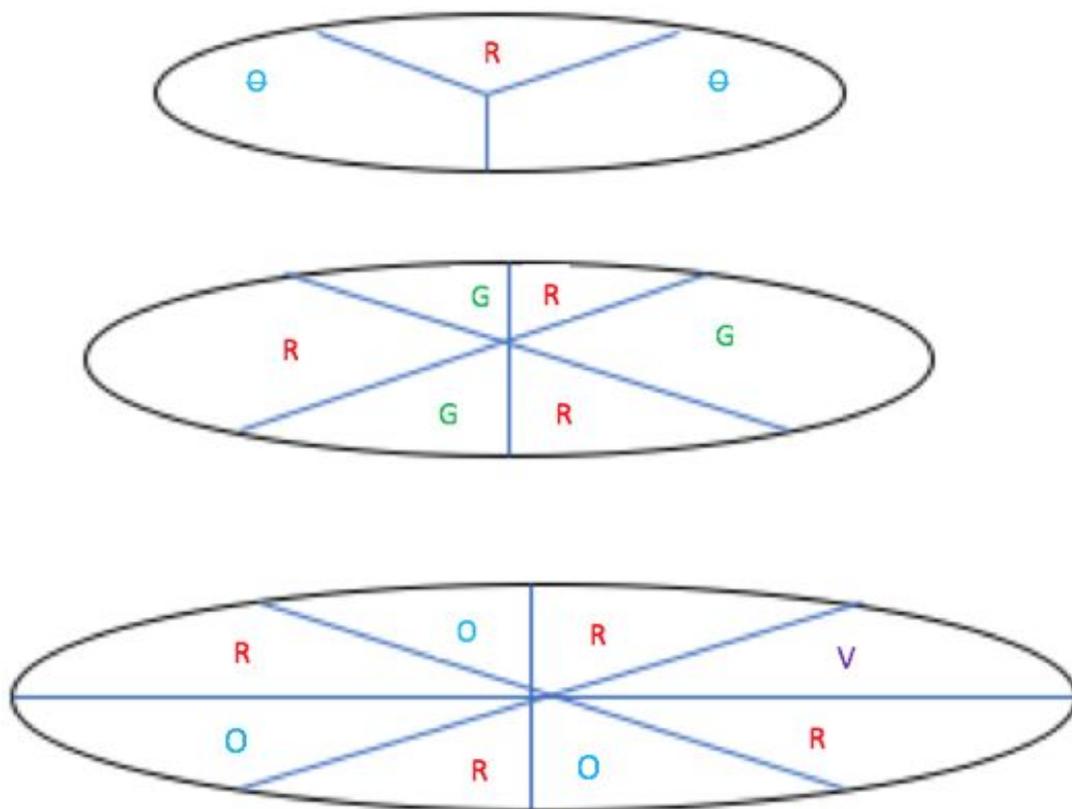
This diagram presents all the fixed information provided by the rules.



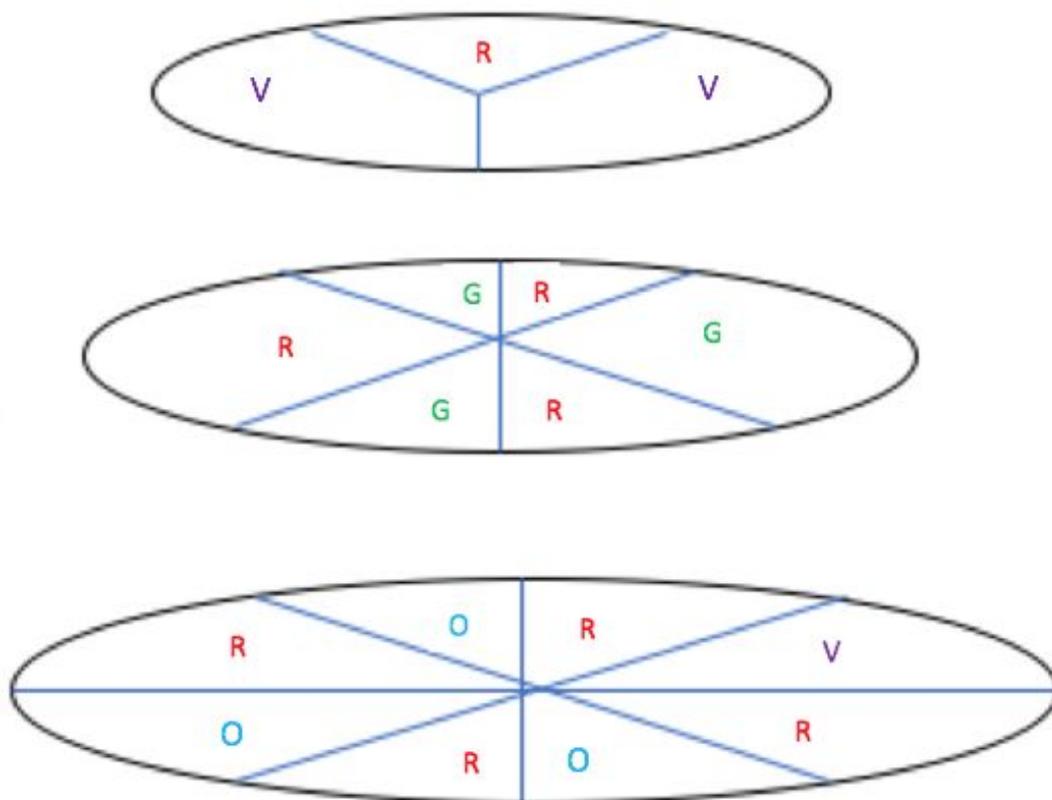
It is finally time to focus on the question:

**If there are a total of three orchids on the cake, where should you deliver the cake when it is finished?**

Add three orchids to the diagram. The middle tier is full, and orchids cannot be on the top tier. This means that the three orchids must be on the bottom tier.



The maximum number of violets in this situation is three: the same number as geraniums. Given that there are three orchids, there is no possible scenario in which there are more violets than geraniums.



Rule 9 is now applicable.

**9. If there are more violets than geraniums, then the wedding venue is the National Mall. Otherwise, the wedding venue is the United States Botanic Gardens.**

According to Rule 9, this means the wedding venue is the United States Botanic Gardens since there are no more violets than geraniums.