

The Pluto's Restaurant

at the Santana Row (San Jose) offers fresh salads and other dishes. When a customer orders a salad, s/he goes through the following steps: (Copied from the store menu)

Step 1: Choose Your Lettuce (Choose only ONE)

Farmer's Greens	Romaine	Baby Spinach
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Step 2: Choose Your Size (Choose only ONE)

Side Salad	Main Salad
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Step 3: Choose Your Seven (7) Salad Fixings

Raw Fixings(10 options)	Cooked Fixings(8 options)	Other Fixings(7 options)
Broccoli	grilled fennel	Sunflower Seeds
Cucumbers	sweet walnuts	Dried Cranberry
Red Onions	Green Beans	Pine nuts
Beets	Sweet corn	Crunchy Croutons
Jicama	Garbanzo Beans	Parmesan Cheese
Peas	Sautéed Mushrooms	California Raisins
Carrots	Caramelized Balsamic Onions	Crumbled Blue Cheese
Granny Smith Apples	Roasted Red Bell Peppers	
Plum Tomatoes		
Navel Oranges		

Step 4: Choose A Fresh Baked Bread(Choose only ONE)

Sourdough	Wheat	Foccacia
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Step 5: (Optional) Add Meat or Vegetarian Option (Add only ONE)

Grilled Herbed Chicken Breast	Herb Roasted Sonoma Turkey	Grilled Certified Angus Beef
Aidells Poultry Sausage	Crispy Chicken Asteroids	Grilled Portobello Mushroom

Step 6: (Optional) Dress Your Salad with One of Our Homemade Dressings (Choose only ONE)

Balsamic Vinaigrette	Cilantro Lime Vinaigrette	Gorgonzola Vinaigrette
Caesar Dressing	L.F. Yogurt Based Honey Mustard	House Special Dressing

The Questions

Fiona and her husband, Sal, went to the restaurant to celebrate their 8th anniversary last weekend. Use the setting to answer the following questions.

1. (8 pts) At step 3, how many different ways can a customer fix his salad?
2. (8 pts) At step 3, if a customer picks 2 fixings from Raw Fixings, and 2 fixings from Cooked Fixings, and 3 fixings from Other Fixings, how many different ways can s/he fix her/his salad?
3. (3 pts) Sometimes the restaurant gives away a coupon read “One extra fixing”, which means the customer can pick up another fixing for their salads. If Fiona decides to use this coupon and pick 8 fixings for her salad, how many different ways can she fix her salad?
4. (8 pts) Going through all 6 steps, (without a coupon) how many different salads can the Pluto’s restaurant serve?
5. (3 pts) Fiona loves to have beets, cranberries and crumbled blue cheese whenever she fixes up her salad. At step #3, if she decided to have the rest of her fixings from the Cooked Fixings category, what is the probability she got sweet walnut or green beans in her fixings?

[Hint: $P(A \cup B) = P(A) + P(B) - P(A \cap B)$]
6. (8 pts) Sal loves to have broccolis, red onions and grilled fennel whenever he fixes up his salad. At step #3 if he decides to have the rest of his fixings from the Cooked Fixings category also, what is the probability he got Garbanzo beans?
7. (12 pts) In step 4, any customer needs to pick a bread to make a salad dish. According to the past experience, the odds for Sal to pick sourdough bread are 4 to 1. Also, whenever Sal picked sourdough bread, the odds for him to pick Balsamic Vinaigrette as dressing for the salad is 5 to 3. However, if he does not pick sourdough bread, the odds for him to pick Balsamic Vinaigrette as dressing becomes 1 to 5. Knowing Sal’s ordering history, what is the likely-hood that Sal will pick Balsamic Vinaigrette as dressing today?