Suppose Bill is on a low-carbohydrate diet. He can eat only three foods: Rice Krispies, cottage cheese, and popcorn. The marginal utilities for each food are tabulated below. Bill is allowed only 167 grams of carbohydrates daily. Rice Krispies, cottage cheese, and popcorn provide, 25, 6 and 10 grams of carbohydrates per cup, respectively. Referring to the accompanying table, respond to the following questions:

Units of food Marginal utility marginal utility marginal utility  
(cups/day) of Rice Krispies of cottage cheese of popcorn

1 175 72 90

2 150 66 80

3 125 60 70

4 100 54 60

5 75 48 50

6 50 36 40

7 25 30 30

8 25 18 20

a) Given that Bill can consume only 167 grams of carbohydrates daily, how many cups of each food will he consume daily? Show your work.

b) Suppose Bill’s doctor tells him to further reduce his carbohydrate intake to 126 grams per day. What combination will he consume?