



## Problem of the Week

### Problem A and Solution

### Carroll Diagram

#### Problem

Carroll diagrams are tables that you use to sort objects based on two properties. The table has two rows and two columns. The rows are for sorting based on whether or not the one property is present and the columns are for sorting based on whether or not the second property is present. At the intersection of a row and column is a cell that contains objects that have both properties identified by the row and column labels.

Arrange the following numbers into the Carroll diagram below:

12, 63, 15, 150, 56, 30, 55, 21, 88, 72

	Even Number	Odd Number
Multiple of 3	12	
Not a Multiple of 3		

The first number has been placed in the diagram already. The number 12 has been added to the cell that is at the intersection of the 'Even Number' column and the 'Multiple of 3' row.

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#### Solution

Here is the completed Carroll diagram:

	Even Number	Odd Number
Multiple of 3	12, 150, 30, 72	63, 15, 21
Not a Multiple of 3	56, 88	55

A quick trick to determine if a number is a multiple of 3 is to calculate the sum of its digits. If the sum of the digits is a multiple of 3, then the original number is also a multiple of 3. For example, for the number 72, the sum of the digits is  $7 + 2 = 9$ . Since the sum of 9 is divisible by 3, then 72 is also divisible by 3. Also, for the number 88, the sum of the digits is  $8 + 8 = 16$ . Since 16 is not divisible by 3, then 88 is not divisible by 3.