**1.2 – More Patterns in Division**

We have looked at how to sort numbers in a Venn diagram. Another way to sort numbers is by using a Carroll Diagram.

**Example 1:**  Which of the following numbers below are divisible by 3? By 8? By both 3 and 8? By neither 3 nor 8? Use a Carroll diagram to arrange the numbers.

10, 12, 24, 32, 120, 139, 224, 252, 819, 1104, 2360, 9212, 11337, 12096

|  |  |  |
| --- | --- | --- |
|  | **Divisible by 3** | **Not Divisible by 3** |
| **Divisible by 8** | 24, 120, 1104, 12096 | 32, 224, 2360 |
| **Not Divisible by 8** | 12, 252, 819, 11337 | 10, 139, 9212 |

We can use a series of “shortcuts” to determine whether a whole number is divisible by any number from 2 – 10. The “shortcuts” are called the ***divisibility rules.***

**Divisibility Rules**

A whole number is divisible by:

2 if the number is even

3 if the sum of the digits is divisible by 3

4 if the number represented by the last 2 digits is divisible by 4

5 if the ones digit is 0 or 5

6 if the number is divisible by 2 and by 3

7 no special rule!

8 if the number represented by the last 3 digits is divisible by 8

9 if the sum of the digits is divisible by 9

10 if the ones digit is 0