

Problem

- a) Suppose you have to place the house numbers from 1 to 100 on a row of 100 new homes. How many 3's would you have to buy in order to do all the numbering?
- b) For what digit(s) other than 3 is the answer the same as in a)? Explain your reasoning.
- c) The remaining digits are required a different number of times. How many would you have to buy of each of these digits?
- d) What is the total number of digits you have to buy for all the houses?

Hints**Part a)**

Suggestion: Supply students with a 1-100 hundreds chart.

Hint 1 - How many 3s are there from 1 to 10? How many 2s?

Hint 2 - For what numbers does 3 occur as a units digit? A tens digit?

Part b)

Hint 1 - Is the total number of 3s the same as the total number of 2s?

Part c)

Hint 1 - What number occurs only once as a tens digit?

Solution

- a) The digit 3 occurs 10 times as a tens digit (30 - 39), and 10 times as a units digit (3, 13, 23, ..., 93), giving a total of 20 times.
- b) The answer is the same for the digits 2, 4, 5, ..., 9, for the same reasons.
- c) The digits 0 and 1 give different answers. There are 11 occurrences of 0 (10, 20, ..., 90, 100), and 21 occurrences for 1 (20 as above, plus an extra in 100).
- d) The total number of digits is thus $8 \times 20 + 11 + 21 = 192$.