

MEMORANDUM

To: Janet Sonenberg

From: Peter

Subject: Memo #85: How many leaves are there on the maple tree?

Date: January 2, 2021

This note captures a short study from Nov. 15-18 answering the question, "How many leaves are here on the maple tree in the backyard of 16 Creighton St.?" The week before Nov. 15, the tree dropped about half its leaves during a wind and rain storm. The leaves were raked into about 15 piles, filling 9.5 leaf bags.

At the start, a 2 quart bowl was filled with leaves from a pile and weighed, giving 31 g. There were 38 leaves in the bowl of sizes varying from 4-13 cm. The dirt and other debris amounted to 2 g, giving an average weight of 0.76 g/leaf. Each leaf occupied a volume of 55 cm³/leaf.

Weighing three bags gave 33 lb/bag, with a 1 lb. variance. Calculation gave 19,415 leaves/bag, with a 3% s.d. The total mass of leaf was 310 lb. and total number of leaves was 184,452.

The filled bags measured 23" high with a circumference of 56" and a compression factor of 10 – each leaf was crushed to 1/10th its size in being loaded into the leaf bags.

At the time of this writing, about 40% of the leaves remain on the tree, giving an estimate of 250,000 leaves, with a 20% uncertainty.

The height of the maple tree was measured on Jan. 2, 2021 using a sextant to measure $52 \pm 2^\circ$ on a baseline of 546 ± 24 in. Uncorrected for observed height, this gives a tree height of 58 ± 5 ft. Corrected height is 56 ft.

References