

EXAMPLE 6 Writing Significant Digits

Here is a description of the Vietnam Veterans Memorial in Washington, D.C.

The Wall consists of the East Wall and the West Wall. The triangular walls are each 246.75 feet long and 10.1 feet tall where they meet at a 125-degree angle. The West Wall points to the Lincoln Memorial, and the East Wall points to the Washington Monument. Each Wall consists of 72 panels: 70 with names and 2 very small, blank panels at each end. There are 58,267 names listed on the Memorial. Approximately 1200 of these names are listed as missing.



Use the information in this description to estimate (a) the area of the Wall and (b) the size of the lettering used on the Wall. In each case, write your answer with only as many significant digits as you think are reasonable.

SOLUTION

- a. Find the area of each triangle.

$$\begin{aligned} \text{Area of each triangle} &= \frac{1}{2}bh \\ &= 0.5(246.75)(10.1) && \text{Base} = 246.75 \text{ ft} \\ & && \text{Height} = 10.1 \text{ ft} \\ &= 1246.0875 \text{ ft}^2 \end{aligned}$$

Doubling this amount gives a total of 2492.175 square feet. Because the height is given with only 3 significant digits, it is best to round the answer to the same. So, the most accurate you can be with the given description is to say that the Wall has an area of about 2490 square feet.

- b. Using an area of 2490 square feet, the average area per name is

$$\frac{58,267 \text{ names}}{2490 \text{ ft}^2} \approx 23.4 \text{ names per square foot.}$$

A square foot contains 144 square inches. So, you would have at most 6 square inches of space to carve each name. One reasonable solution is that the letters might be 1/2 inch high. This would leave 12 inches for the length of each name.

 **Checkpoint**

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Suppose you were planning the Wall. You want to list each name as

First Name Middle Initial Last Name.

How could you estimate the average number of characters used in the names? What is your estimate?

