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Problem 1

Four lengths of fence are measured and found to be 4.57 m, 6.24 m, 4.24 m, and 5.78 m. Each measurement has an uncertainty of 0.10 m. Find P_m , the perimeter and uncertainty.

$$P = l_1 + l_2 + w_1 + w_2$$

$$P = 4.57 \text{ m} + 6.24 \text{ m} + 4.24 \text{ m} + 5.78 \text{ m}$$

$$P = 20.83 \text{ m.}$$

$$\begin{aligned}\Delta P &= \sqrt{(0.10 \text{ m})^2 + (0.10 \text{ m})^2 + (0.10 \text{ m})^2 + (0.10 \text{ m})^2} \\ &= 0.20 \text{ m.}\end{aligned}$$

$$P_m = 20.83 \pm 0.20 \text{ m.}$$