Max Kiene

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Problem 4

The length and width of a basketball court is determined and found to be 94.07 feet by 50.01 feet. Each measurement has an uncertainty of 0.88 feet. Find the area, A_m.

$$\begin{aligned} A &= l \times w \\ A &= 94.07\,\text{feet} \times 50.01\,\text{feet} \\ &= 4704.4407\,\text{feet}. \end{aligned}$$

$$\begin{aligned} \Delta A &= |4704.4407| \sqrt{\left(\frac{0.88\,\text{feet}}{94.07\,\text{feet}}\right)^2 + \left(\frac{0.88\,\text{feet}}{50.01\,\text{feet}}\right)^2} \\ &= 93.752\,694\,766\,6\,\text{feet}. \end{aligned}$$

$$A_\mathrm{m} = 4704.44 \pm 93.8\,\text{feet}^2.$$