You are to fix dinners for 440 people at a convention of Mexican food fans. Your recipe calls for 4 peppers per serving (one serving per person). However, you have only habanero peppers on hand. The spiciness of peppers is measured in terms of the scoville heat unit (SHU). On average, one pepper has a spiciness of 4000 SHU and one habanero pepper has a spiciness of 300000 SHU. To get the desired spiciness, how many habanero peppers should you substitute for the peppers in the recipe for the 440 dinners?

Solution

Let p is a number of peppers to get the desired spiciness, h is a number of habanero peppers to get the desired spiciness. So, the total spiciness must be equal:

$$p \cdot 4000 \text{ SHU} = h \cdot 300000 \text{ SHU}.$$

But $p = 4 \cdot 440$. Thus

$$h = \frac{4 \cdot 440 \cdot 4000 \text{ SHU}}{300000 \text{SHU}} = 23.5.$$

Answer: 23.5.