

## Answer on Question #86433 – Math – Algebra

### Question

As a contrast between the old and the modern and between the large and the small, consider the following: In old rural England 1 hide (110 acres) was the area of land needed to sustain one family with a single plough for one year. (An area of 1 acre is equal to 4047 m<sup>2</sup>.) Also, 1 wapentake was the area of land needed by 100 such families. In quantum physics, the cross-sectional area of a nucleus (defined in terms of the chance of a particle hitting and being absorbed by it) is measured in units of barns, where 1 barn is  $1 \times 10^{-28}$  m<sup>2</sup> (exactly). (In nuclear physics jargon, if a nucleus is “large,” then shooting a particle at it is like shooting a bullet at a barn door, which can hardly be missed.) What is the ratio of 22 wapentakes to 16 barns?

### Solution

The ratio of 22 wapentakes to 16 barns is

$$\frac{22 \cdot 100 \cdot 4047}{16 \cdot 1 \cdot 10^{-28}} = 5.56 \cdot 10^{33}$$

**Answer:** The ratio of 22 wapentakes to 16 barns is  $5.56 \cdot 10^{33}$ .