In f.cpp (Food Processor), logarithms are used to determine how long it takes for a blade to cut down food to a given size. Here's how I derived the formula used.

First I defined some variables:

- h - halving time
- a - starting size
- b - ending size
- t - time elapsed

And put them in this relation:

$$b = a \cdot \left(\frac{1}{2}\right)^{t/h}$$

Then I solved for t:

$$\frac{b}{a} = \left(\frac{1}{2}\right)^{t/h}$$

$$\frac{t}{h} = \log_{1/2}\left(\frac{b}{a}\right)$$

$$t = h \cdot \log_{1/2}\left(\frac{b}{a}\right)$$

And finally, I used the change of base formula:

$$t = h \cdot \frac{\log\left(\frac{b}{a}\right)}{\log(1/2)}$$

This formula says how long it takes to get from one size to another given a certain halving time.