Method of Finding Generation Time:

Xo = Number of cells at initial time

Xt = number of cells at later time

T = Time from Xo to Xt

K = number of doublings per unit of time.

$$\textbf{Formula:}\quad K = \frac{Xt - Xo}{(T)(0.301)}$$

Sample Problem: Xo = 100 cells = 2.0000 (Convert to Log characteristics)

Xt = 1,000,000 = 6.0000

T = 4 hours

Note: When dealing with multiples of 10 Mantissa will always be 0 Therefore, you don't have to subtract (2 - Mantissa, which is the decimal part of the Logarithm.) If you have a number in a base other than 10 then you would have to convert your number to a decimal and look up its Mantissa). [Generation times are usually plotted as logarithm to the base 10, obtained by multiplying the logarithm to the base 2 of a number by .3010]

Note: **Characteristic** = the number to the left of the decimal, is always one number less than the number.
Example 5000.00 has 4 characters left of the decimal.
So, 4 - 1 = 3 (Your characteristic would then be 3)

$$K = \frac{Xt - Xo}{(T)(0.301)}$$

$$\frac{6 - 2}{(T)(0.301)} = \frac{4}{(4\text{hrs})(0.301)} = \frac{1}{0.301(\text{hrs})} = 3.32 \text{ Doublings per hour}$$

Next:
Convert reciprocal of K:

$$1/K = \frac{1 \text{ Hour}}{3.32 \text{ Doublings}} = \frac{60 \text{ min}}{1 \text{ Hour}} = \frac{60 \text{ min}}{3.32 \text{ doublings}} = 18.1 \text{ min. per doubling}$$