Answer on Question #60140 – Math – Algebra

Question

A rural population (given in thousands) is thought to decline according to the
equation p=15e^(-0.1t). if t=0 at the beginning of 1998.
1) calculate the numbers in the population at the beginning of 1990,2000,2016;
2) graph population up to 2050;
3) calculate the number of years it will take for the population to decline to 10000.
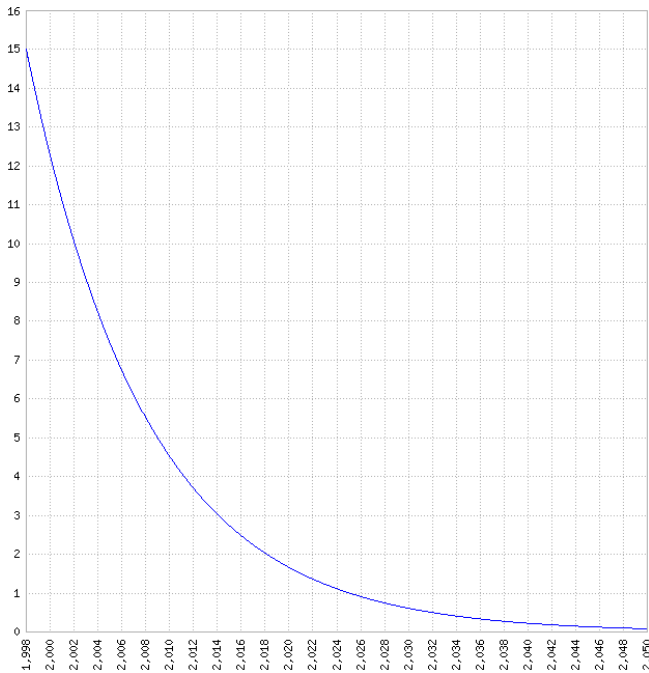
Solution

1) 1990: $p(-8) = 15e^{-0.1*(-8)} = 15e^{0.8} = 33.383$ (in thousands);

2000: $p(2) = 15e^{-0.1*2} = 15e^{-0.2} = 12.281$ (in thousands);

2016: $p(18) = 15e^{-0.1*18} = 15e^{-1.8} = 2.479$ (in thousands).

2)

3) $15e^{-0.1t} = 10 \rightarrow t = -10ln\frac{10}{15} \approx 4$ (years).