Exponential Growth/Decay Equation: $A(t) = Ce^{kt}$

where C is the amount of the substance present at time $t = 0$

and k is a constant that is positive for growth models and negative for decay models.

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1. If a bacterial culture initially contains 30 bacteria which can double every four hours, answer the following questions:

    Find an equation to represent the number of bacteria in the culture at any time t (i.e. setup the exponential growth equation and find the constants C and k)

    How many cells will be in the culture after 12 hours?

    How many cells will be in the culture in 13 hours?

    How long will it take till there are 300 cells in the culture?

2. A radioactive substance has a half-life of 5 days. If there are initially 2000 pounds of the substance in a container, answer the following:

Find an equation to represent the number of pounds of the sample at any time t
(i.e. setup the exponential decay equation and find the constants C and k)

How many pounds will be left after 20 hours?

How many pounds will be left after 19 hours?

How long will it take till there are 2 pounds of the sample left?