6. (11 points) A fresco supposedly painted by the Italian Renaissance artist Alessandro Botticelli (1445-1510) currently contains 92% of its carbon-14 (half-life 5730 years.) From this information, decide whether Botticelli could have painted the fresco. Show step-by-step calculations, and briefly explain your conclusion.

- $\frac{1}{2}C_0 = C_0\ b^{5730}$, which means: $\left(\frac{1}{2}\right)^{1/5730} = b$, or $b \simeq 0.999879$

- $0.92\ C_0 = C_0\ 0.999879^t$, which means: $\frac{\ln(0.92)}{\ln(0.999879)} = t$, or $t \simeq 689.29$ years.

So, about 689.29 years have passed since the fresco was done, or the painting was done either in the year 1316 or 1317 (since $2006 - 689.29 = 1316.71$.)

This is *before* Botticelli was born, so he could have not painted the fresco.