Algebra word problems

1. The population of a city was 124 thousand in 1992. The exponential growth rate was 1.6% per year. Use the exponential growth model p0ekt.

​a) Find the exponential growth function in terms of​ t, where t is the number of years since 1992.

p(t)=

2. The length of the instruction book for a​ country's tax code increased exponentially from 5 pages in 1935 to 163 pages in 2011.

**​a)** Let t=0 correspond to 1935 and t=76 correspond to 2011. Then t is the number of years since 1935. Use the data points (0,5​) and (76,163​) to find the exponential growth rate and fit an exponential growth function C(t)=C0*e*kt to the​ data, where​ C(t) is the number of pages in the instruction book.

**​b)** Use the function found in part​ (a) to estimate the total number of pages in the instruction book in 2013.

**​**

**c)** When will there be 625 pages in the instruction​ book?

**​a)** C(t)=

​(Type your answer using exponential notation. Use integers or decimals for any numbers in the equation. Do not round until the final answer. Then round to the nearest thousandth as​ needed.)

3. The​ sales, S, of a product have declined in recent years. There were 203 million sold in 1984 and 1.3 million sold in 1994. Assume the sales are decreasing according to the exponential decay​ model, S(t)=S0*e*−kt.

​a) Find the value k and write an exponential function that describes the number sold after​ time, t, in years since 1984.

​b) Estimate the sales of the product in the year 2002.

​c) In what year​ (theoretically) will only 1 of the product be​ sold?

​a) Rounded to six decimal​ places, k=