Tuberculosis Cases The table shows the numbers N (in thousands) of tuberculosis cases in the United States from 1991 through 2016. The data can be modeled by the rational model

$$N = \frac{29.4 - 0.32x}{1 + 0.05x}$$

where t represents the year, with $t = 1$ corresponding to 1991. (*Source:* Centers for Disease Control and Prevention)

Spreadsheet at LarsonPrecalculus.com

Year	Tuberculosis cases, N (in thousands)	Year	Tuberculosis cases, N (in thousands)
1991	26.283	2004	14.499
1992	26.673	2005	14.065
1993	25.102	2006	13.728
1994	24.206	2007	13.281
1995	22.726	2008	12.890
1996	21.210	2009	11.517
1997	19.751	2010	11.157
1998	18.286	2011	10.509
1999	17.499	2012	9.940
2000	16.308	2013	9.561
2001	15.945	2014	9.398
2002	15.055	2015	9.547
2003	14.835	2016	9.272

(a) Use a graphing utility to plot the data and graph the model in the same viewing window.

(b) Use the model to approximate the number of tuberculosis cases in the United States for each year from 1991 to 2016.

(c) Compare the estimated to the actual data. Is the model a good fit for the data? Explain.

(d) Use the *regression* feature of the graphing utility to find a linear model and a quadratic model for the data.

(e) Compare the linear, quadratic, and rational models by determining how well each model fits the data.

(f) Which model do you think is best to predict future numbers of tuberculosis cases? Explain your reasoning. Then use this model to predict the number of tuberculosis cases in 2025.