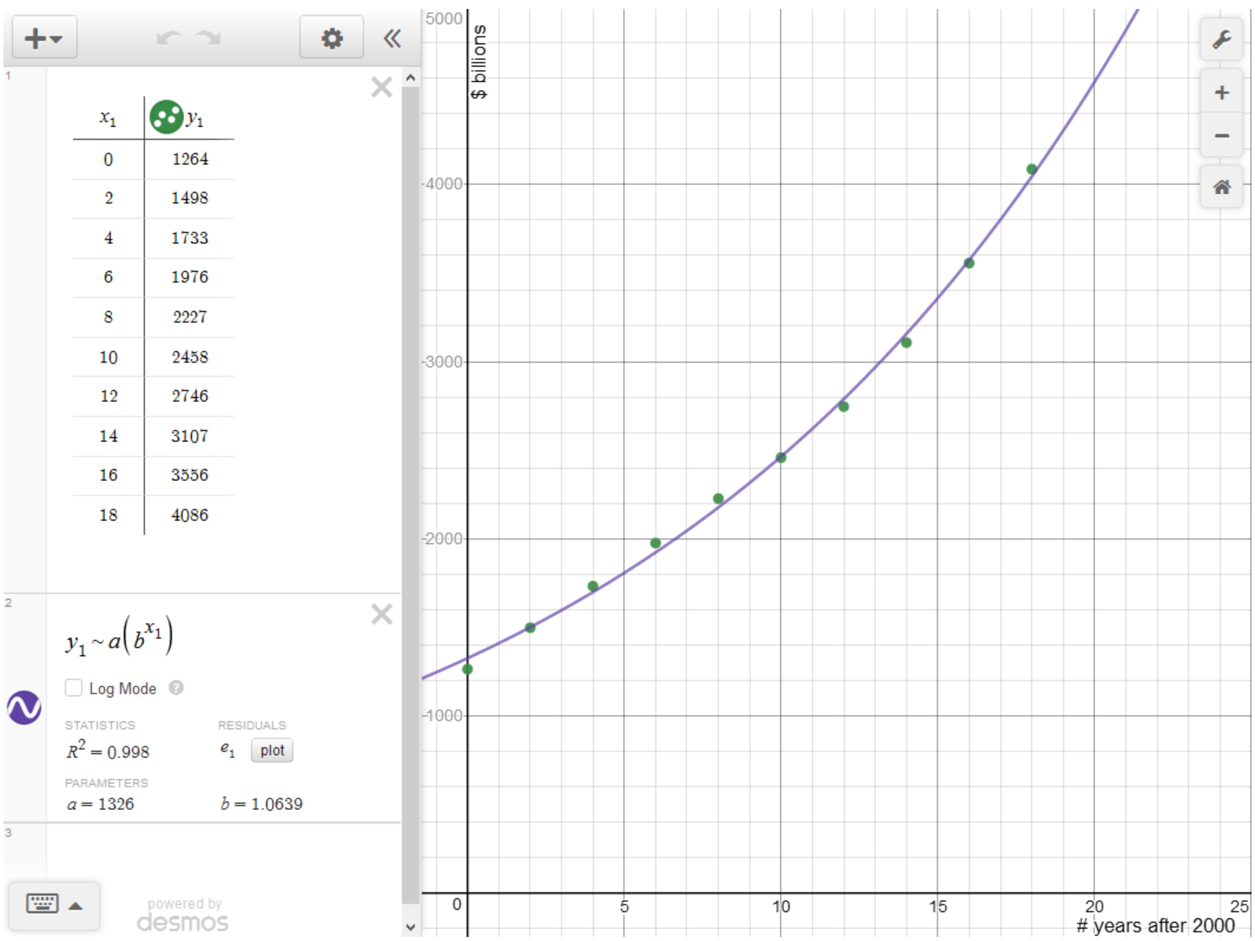
Health Service Expenditures *The following table gives total U.S. expenditures (in billions of dollars) for health services and supplies for selected years from 2000 and projected to 2018.* [1]

Year	$ (billions)	Year	$ (billions)
2000	1264	2010	2458
2002	1498	2012	2746
2004	1733	2014	3107
2006	1976	2016	3556
2008	2227	2018	4086

(Source: U.S. Centers for Medicare and Medicaid Services)

a. *Find an exponential function to model these data, with x equal to the number of years after 2000.*

Because x equal to the number of years after 2000, we'll start by assigning an x-value to each year: $x = 0$ for the year 2000, $x = 2$ for the year 2002, $x = 4$ for the year 2004, and so forth, until we get to $x = 18$ for the year 2018.



I plotted the data and used the exponential regression function on our calculator to find the exponential model of best fit.

[1] Harshbarger/Yocco, *College Algebra In Context*, 5e, p. 373 #32.

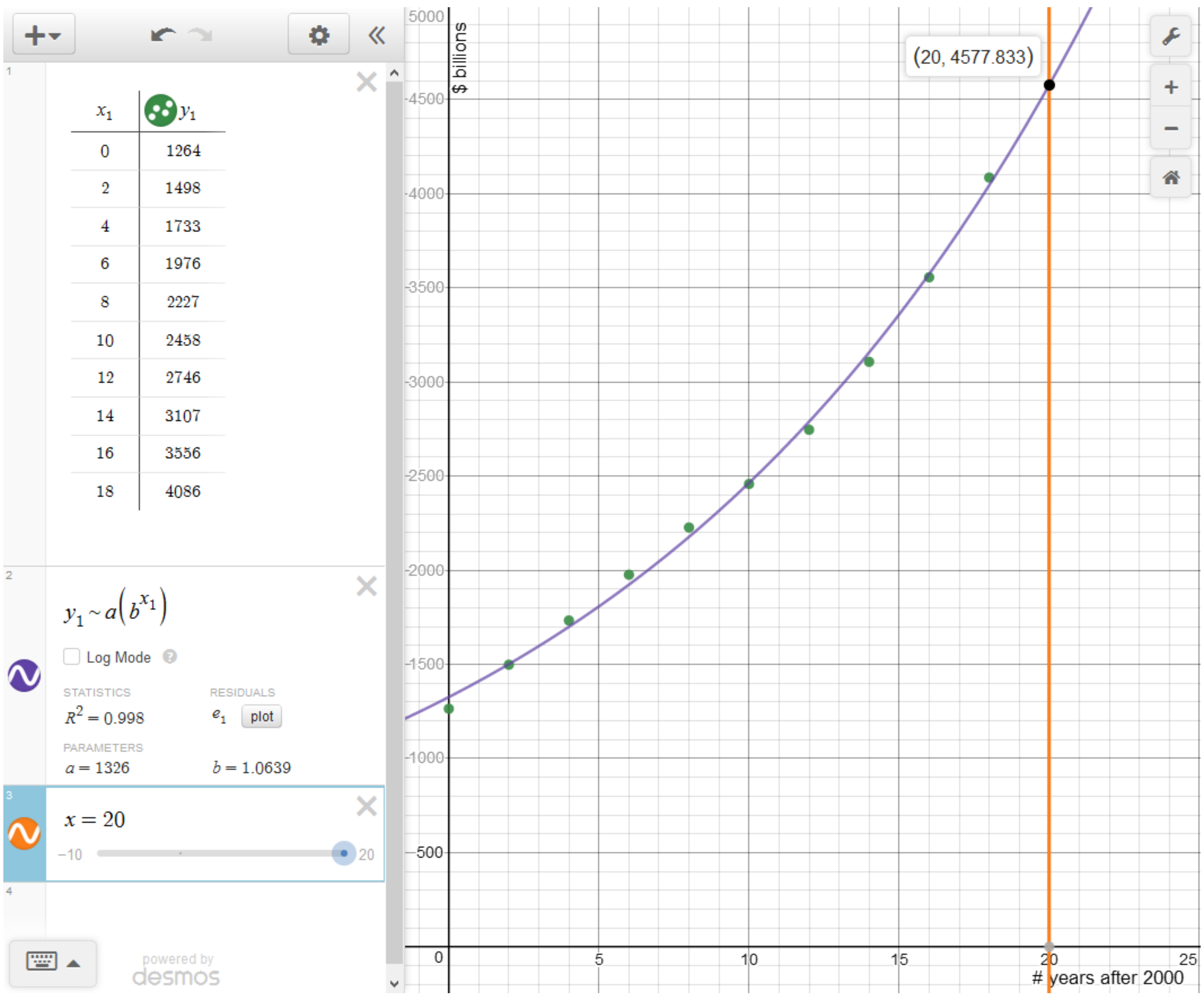
Most graphing utilities give the best-fitting exponential model in the form $y = a \cdot b^x$.

The exponential model that best fits these data is $y = 1326\,(1.0639)^x$.

(I also did this regression on my TI-84+ and got the slightly different equation $y = 1318.744\,(1.064^x)$.)

b. *Use the model to estimate the U.S. expenditures for health services and supplies in 2020.*

The vertical line $x = 20$ represents the year 2020. The intersection of this vertical line with our exponential regression model is at the point $(20, 4577.833)$.



Remember that the y-coordinate is given in billions of dollars. So, the U.S. expenditures for health services and supplies in 2020 is estimated to be \$4,578,000.

(I did this problem using Desmos.com. But when I used my TI-84+, the answer I got was \$4,600,000.)