

F-IF A-SSE Modeling London's Population

Task

The table below shows historical estimates for the population of London.

Year	1801	1821	1841	1861	1881	1901	1921	1939	1961
London population	1,100,000	1,600,000	2,200,000	3,200,000	4,700,000	6,500,000	7,400,000	8,600,000	8,000,000

No data was available in 1941 because of the war.

- Can the London population data be accurately modeled by a linear, quadratic, or exponential function? Explain.
- A *logistic growth* equation can be written in the form

$$P(t) = \frac{a}{1 + e^{-b(t-c)}}$$

where a , b , and c are positive numbers and t represents time measured in years. Using the application supplied, determine if the London population data can be accurately modeled by a logistic equation.

- Explain the shape of the graph of P in terms of the structure of the equation $P(t) = \frac{a}{1 + e^{-b(t-c)}}$. What impact do the values of a , b , and c have on the graph of P ?



