

## Introduction to Quadratics: Day 3 – Applications

Year	Births
1950	372009
1951	381092
1952	403559
1953	417884
1954	436198
1955	442937
1956	450739
1957	469093
1958	470118
1959	479275
1960	478551
1961	475700
1962	469693
1963	465767
1964	452915
1965	418595
1966	387710
1967	370894

Use the table of values on the left to plot points on the graph below and draw a **parabola of best fit**. Be sure to label your axes appropriately!



What is the vertex of this parabola?

What does the vertex represent?

In what year did the number of births reach a maximum?

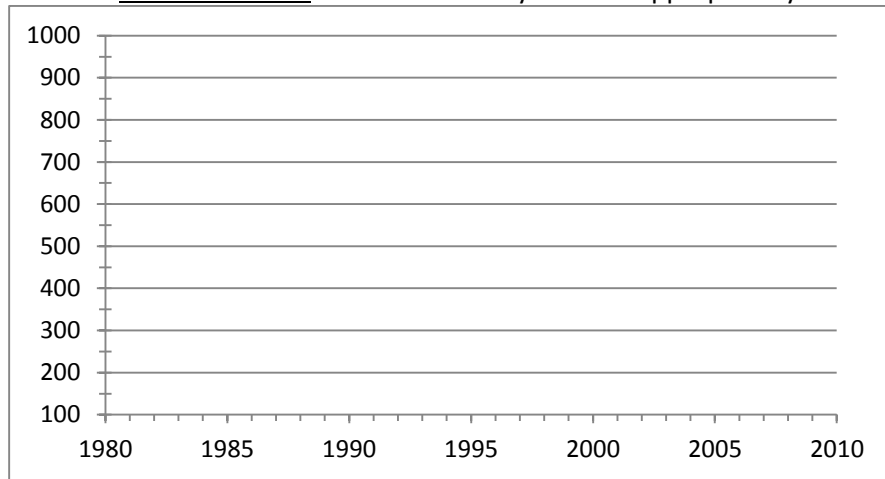
What was the maximum number of births?

Is the parabola useful for predicting births into the future?

Every year, many people become infected with HIV. Over 90% of HIV infections in children are due to mother-to-child transmission at birth. The data in the table show the number of mother-to-child HIV infections diagnosed in the US in various years from 1985-2005.

Year	Cases
1985	210
1987	500
1990	780
1993	770
1996	460
1998	300
2001	317
2003	188
2005	142

Use the table of values on the left to plot points on the graph below and draw a **curve of best fit**. Be sure to label your axes appropriately!



1. Do you think a linear or quadratic model would be best for this data? Explain.
2. What is the vertex of this parabola?
3. What does the vertex represent?
4. When do you think new HIV vaccines were introduced? Why?
5. Do you think the number of cases of HIV will ever reach 0? Explain.