

Practice

Polynomial Models in the Real World

Find a polynomial function that best models each set of values.

1. Let x = the number of years after 1985.

World Gold

Year	Production (millions of troy ounces)
1985	49.3
1990	70.2
1995	71.8
2000	82.6

SOURCES: *The World Almanac* and *World Gold*

2. Let x = the number of years after 1970.

Life Expectancy

Year of Birth	Female (years)
1970	74.7
1980	77.4
1990	78.8
2000	79.7

SOURCE: U.S. Bureau of the Census

3. Let x = the number of years after 1985.

U.S. Energy

Year	Total Production ($\times 10^{15}$ Btu)
1985	64.9
1990	70.8
1995	71.0

SOURCE: Energy Information Administration

4. Let x = the number of years after 1980.

Social Security Benefits

Year	Monthly Average (dollars)
1980	321.10
1990	550.50
2000	844.60

SOURCE: www.infoplease.com

Find a cubic and a quartic model for each set of values. Then determine which model best represents the values.

- 5.

x	-2	-1	0	1	2
y	-7	-3	3	5	-3

- 6.

x	-2	-1	0	1	2
y	2	-6	2	8	42

Use your models from Exercises 9-12 to make predictions.

- Estimate world gold production for 2010, 2020, and 2025.
- Estimate the life expectancy for women born in 1986, 1992, and 2005.
- Estimate the U.S. energy production for 2002, 2005, and 2010.
- Estimate the average monthly Social Security benefits for 1970, 1996, and 1999.