Draw picture for function

I. **Percentage Change**
   The percentage change or _____ in a function is the percentage _____ in the function from one value of the _____ variable to another.

   Formula

   Example:

   TABLE 2.1 Population of the United States

Year	Population (millions)	Year	Population (millions)
1790	3.93	1900	76.21
1800	5.31	1910	92.23
1810	7.24	1920	106.02
1820	9.64	1930	123.20
1830	12.87	1940	132.16
1840	17.07	1950	151.33
1850	23.19	1960	179.32
1860	31.44	1970	203.30
1870	38.56	1980	226.54
1880	50.19	1990	248.71
1890	62.98	2000	281.42
		2010	308.75

   You try—Find the percentage change in the U.S. population from 1800 to 1810

II. **Average growth rate**
The average growth rate of a function over an _____ is the change in the function _____ by the change in the _____variable.

Formula

Example: The population of Russia declined from about 146 million in 2000 to about 143 million in 2007. Calculate the average growth rate over this period and explain its meaning.

III. **Interpolation**
Interpolation is the _____ of estimating _____values <u>between known data points</u> using average _____ rate.

- **Example: In the fall of 2005, 37.7% of college freshmen in the United States believed that marijuana should be legalized. In the fall of 2008, that figure was 41.3%. Use these figures to estimate the percentage in the fall of 2007. The actual figure for 2007 was 38.2%.**

- **What does this say about how the growth rate in the percentage varied over time?**

IV.   **Extrapolation**
       Extrapolation is the process of _____ unknown values <u>beyond</u> <u>know data points</u> using the _____ growth rate.

Example

- **The following table shows the average age, in years, of first-time mothers in the given year.**

Year	1970	1980	1990	2000
Average age	21.4	22.7	24.2	24.9

1. **Estimate the average age of first-time mothers in 1997.**

2. **Predict the average age of first-time mothers in 2005.**

3. **Predict the average age of first-time mothers in the year 3000. Explain why the resulting figure is not to be trusted.**