Sept 2nd or 3rd, 2021
Today's ADENDA

- **Cover Sections 3.4 -3.5, w/ missed topics**
- **Sample HW problems**
- **TEST Review Problems**
- **HW Time**

WARM-UP

1) It is possible for a set of data to be skewed both to the left and the right (both positively and negatively skewed). TRUE false

2) A data set includes two outliers, one large and one small. If both outliers are removed, the result could leave both the median and mean unchanged. TRUE false

WARM-UP

1) It is possible for a set of data to be skewed both to the left and the right (both positively and negatively skewed). TRUE false

It is not possible for a single data set to be skewed both ways.

2) A data set includes two outliers, one large and one small. If both outliers are removed, the result could leave both the median and mean unchanged. TRUE false

Removing both will definitely preserve the median, and could also keep the mean the same provided the outliers had the same deviation.

Review of Concepts from Text that we skipped

Learning Objectives

After this section, you should be able to…

- ✓ MEASURE data sets using time series plots
- ✓ MEASURE density in histograms when class intervals are unequal
- ✓ INTERPRET cumulative relative frequency graphs
- ✓ Be ready to REVIEW chapters 1, 2, and 3 topics

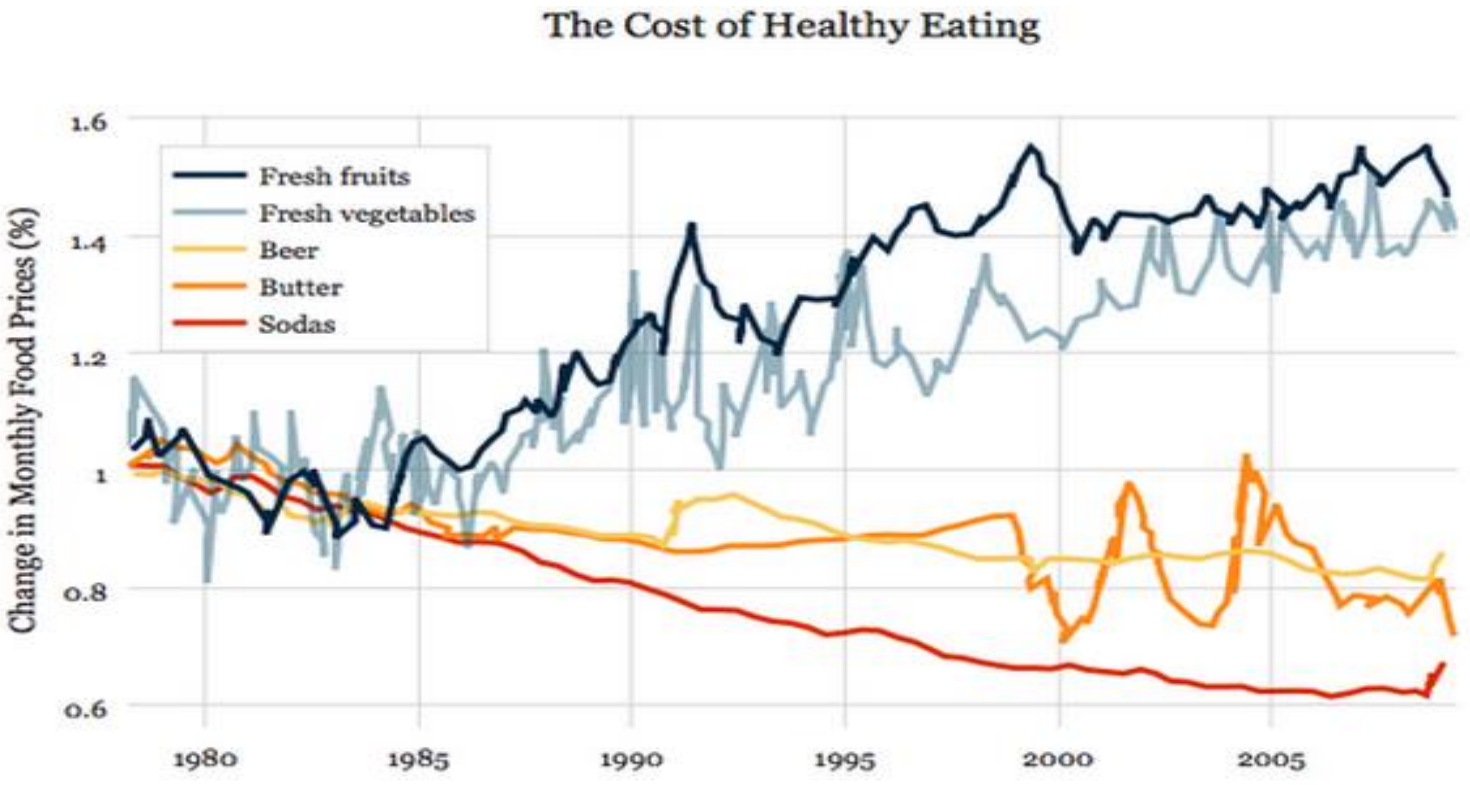
Time Series Plots

- Data sets often consist of measurements collected over regular time intervals. A **time series plot** (or *time plot*) is a simple graph that helps to identify trends or patterns.
- This is a form of bivariate data, where the ordered pairs (*x*, *y*) typically chart the *y* value as the observed variable, and the *x value* is the time at which the observation was made.

Time Series Plots

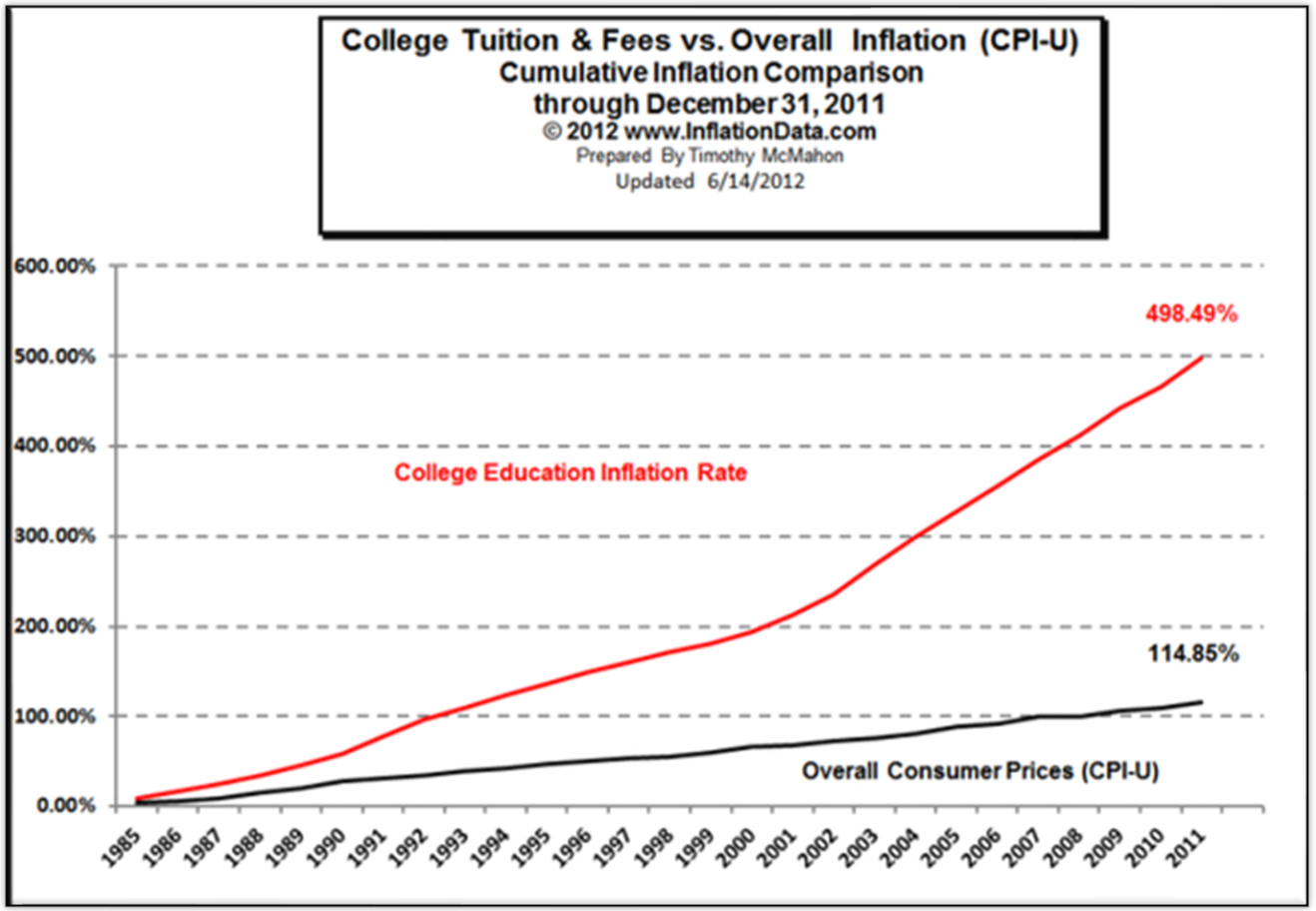
Examples of **time series plots :** simple graphs that help to identify trends or patterns.

EXAMPLES

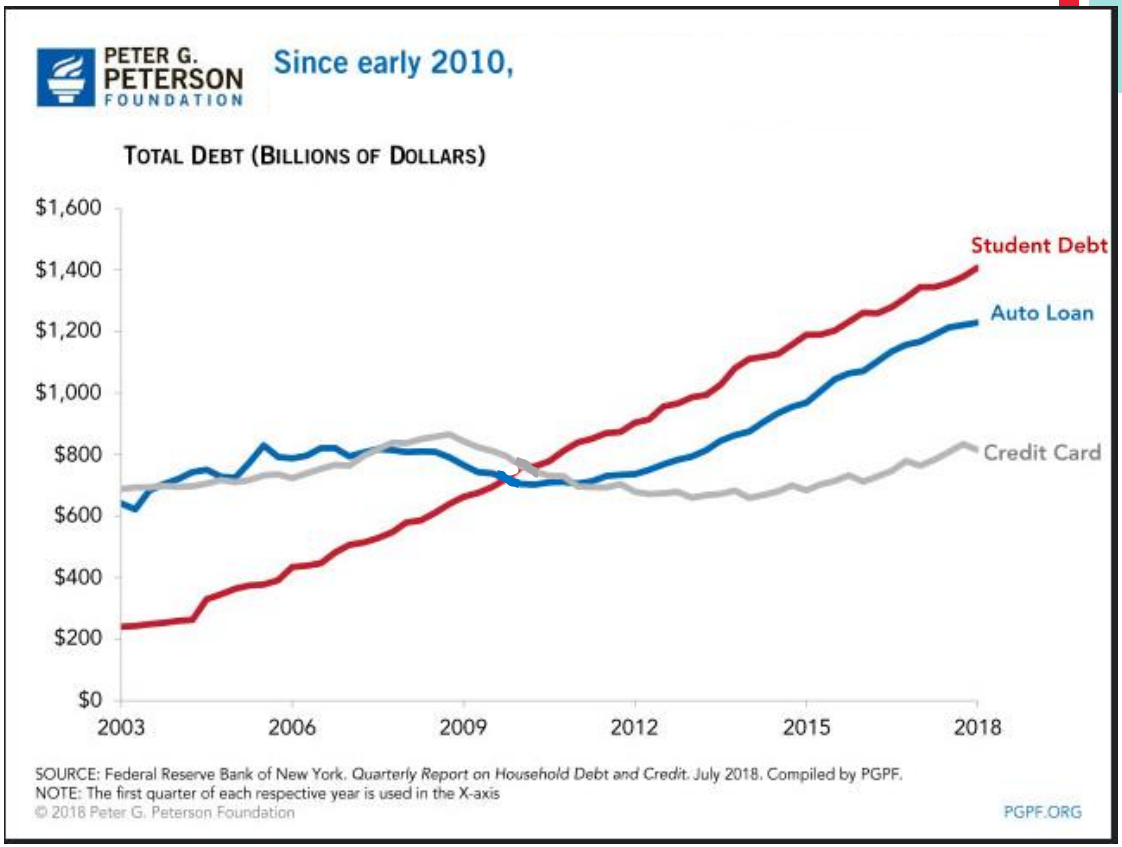


Time Series Plots

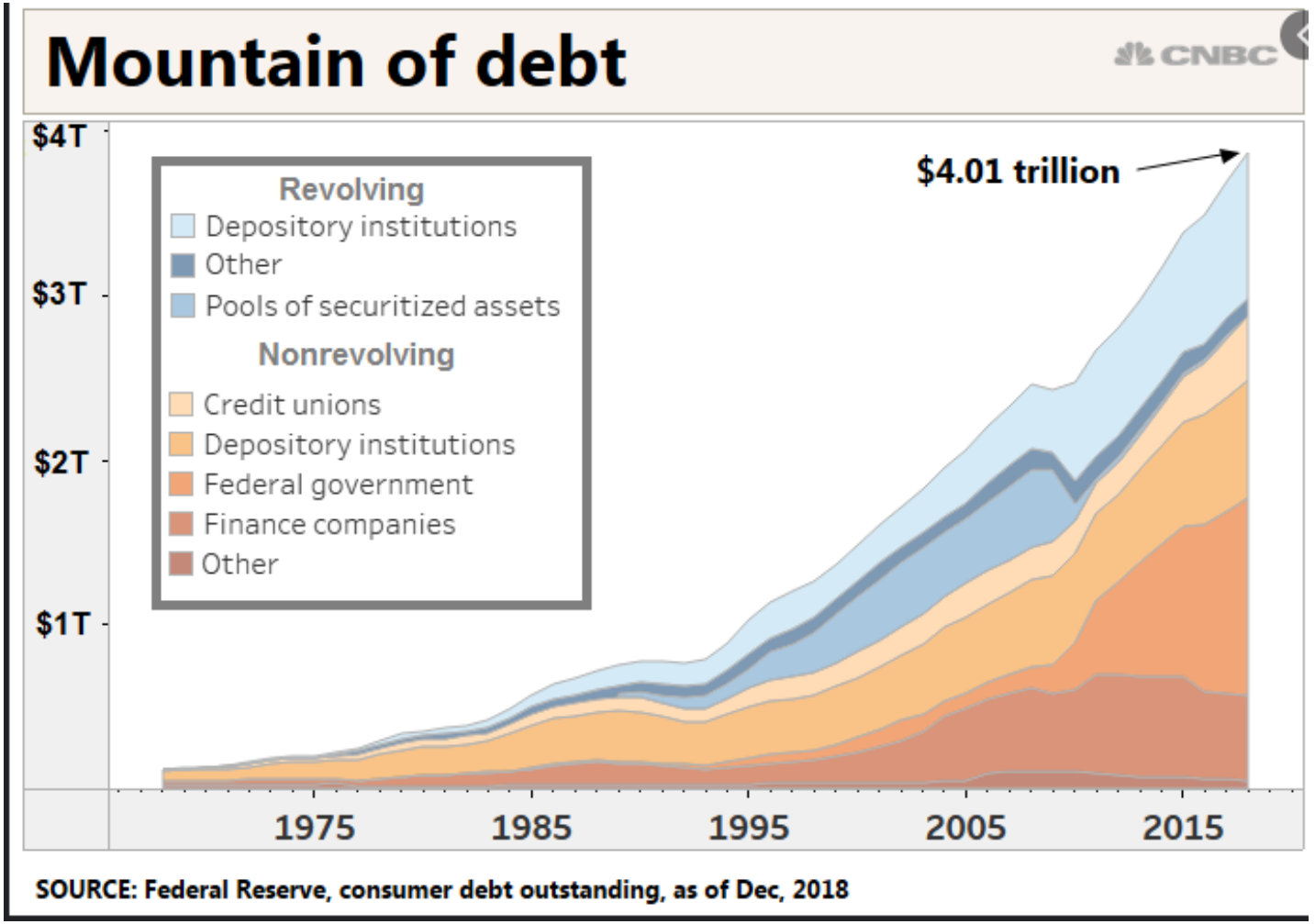
Examples of **time series plots :** simple graphs that help to identify trends or patterns.



RISING **Debt** in your Lifetime



Types of DEBT



Measuring Density in a Histogram

Problem #3.28 from HW (p. 117)

U.S. Census data

- When constructing a histogram with intervals that are *not equal*, we calculate a **density** for a class interval:

- density = $\frac{relative\ freq.}{class\ interval\ width}$

Commute time	Freq.	Relative Freq.	Density
0 to <5	5200	$\frac{5200}{100400} = 0.052$	
5 to <10	18,200	$\frac{18200}{100400} = 0.181$	
10 to <15	19,600	$\frac{19600}{100400} = 0.195$	
…	…	…	…

Problem #3.28 from HW (p. 117)

Density of class interval

Commute time	Freq.	Relative Freq.	Density
…	…	…	…
45 to <60	4000	$\frac{4000}{100400} = 0.039$	
60 to <90	2100	$\frac{2100}{100400} = 0.021$	
90 to <120	2200	$\frac{2200}{100400} = 0.022$	

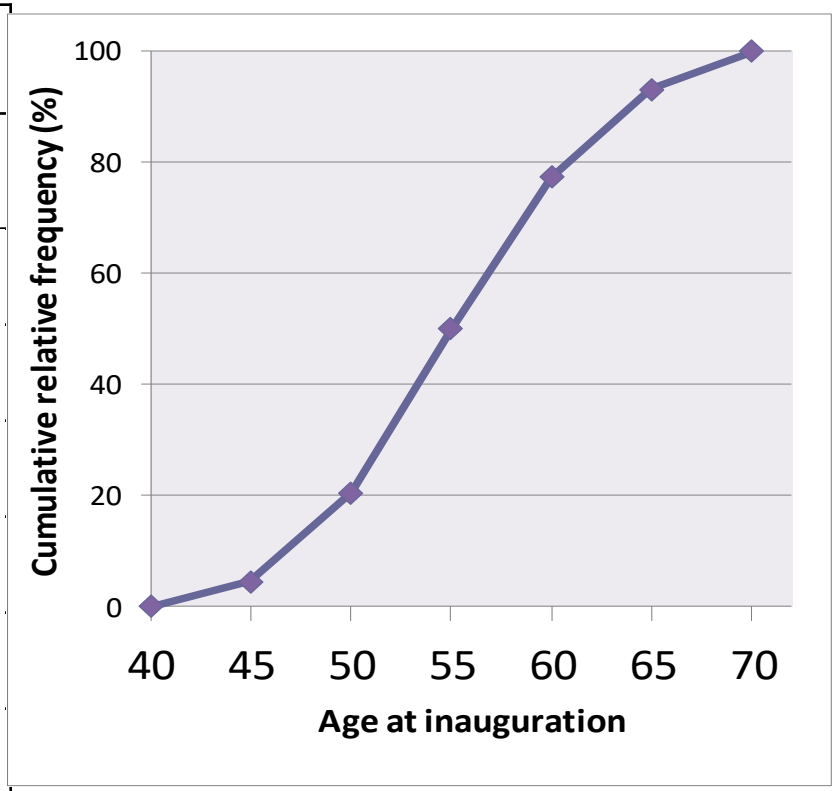
Cumulative Relative Frequency Graphs

A **cumulative relative frequency** graph (or **ogive**) displays the cumulative relative frequency of each class of a frequency distribution.

How young was Barack Obama, compared to other presidents?

Age of First 44 Presidents when They Were Inaugurated

Age	Frequency	Relative frequency	Cumulative frequency	Cumulative relative frequency
40-44	2			
45-49	7			
50-54	13			
55-59	12	27%		
60-64	7			
65-69	3			

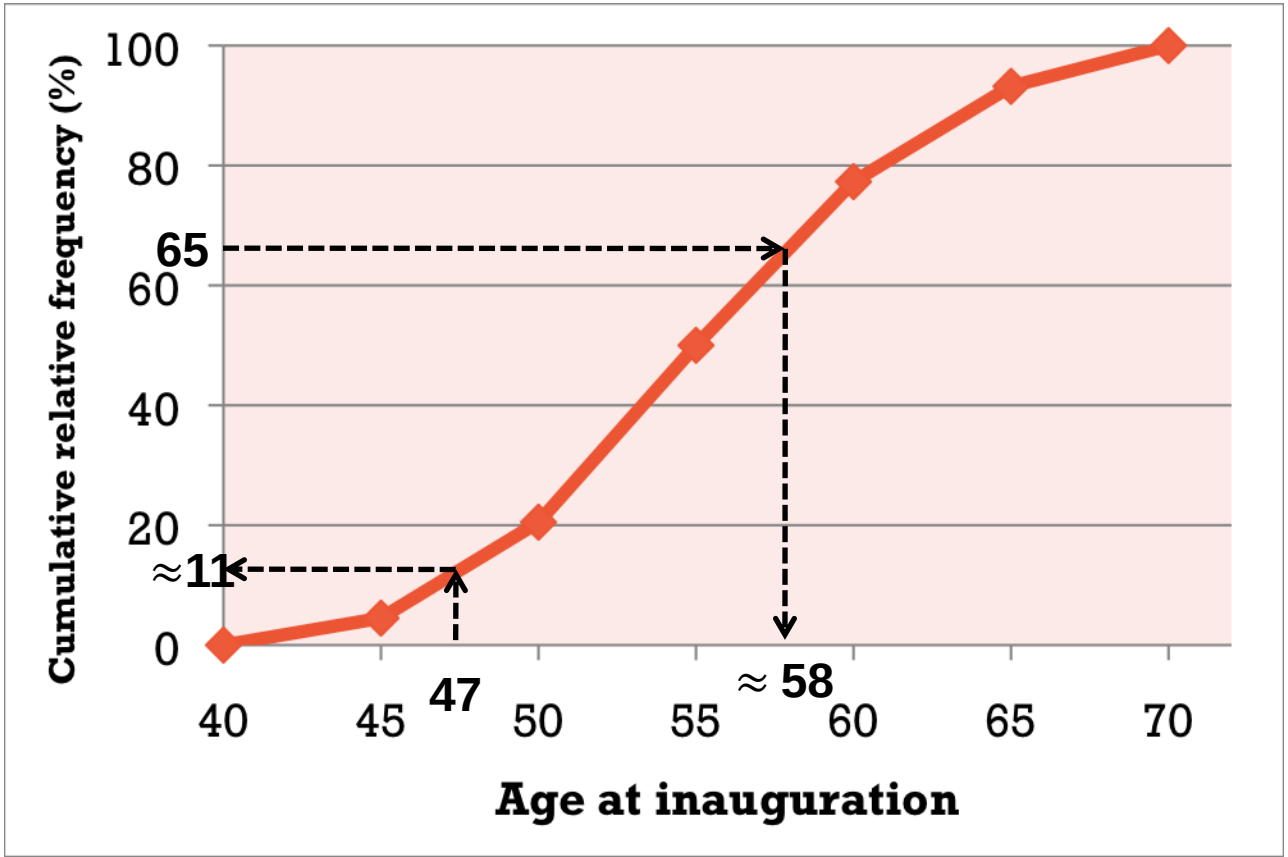


- **Interpreting Cumulative Relative Frequency Graphs**

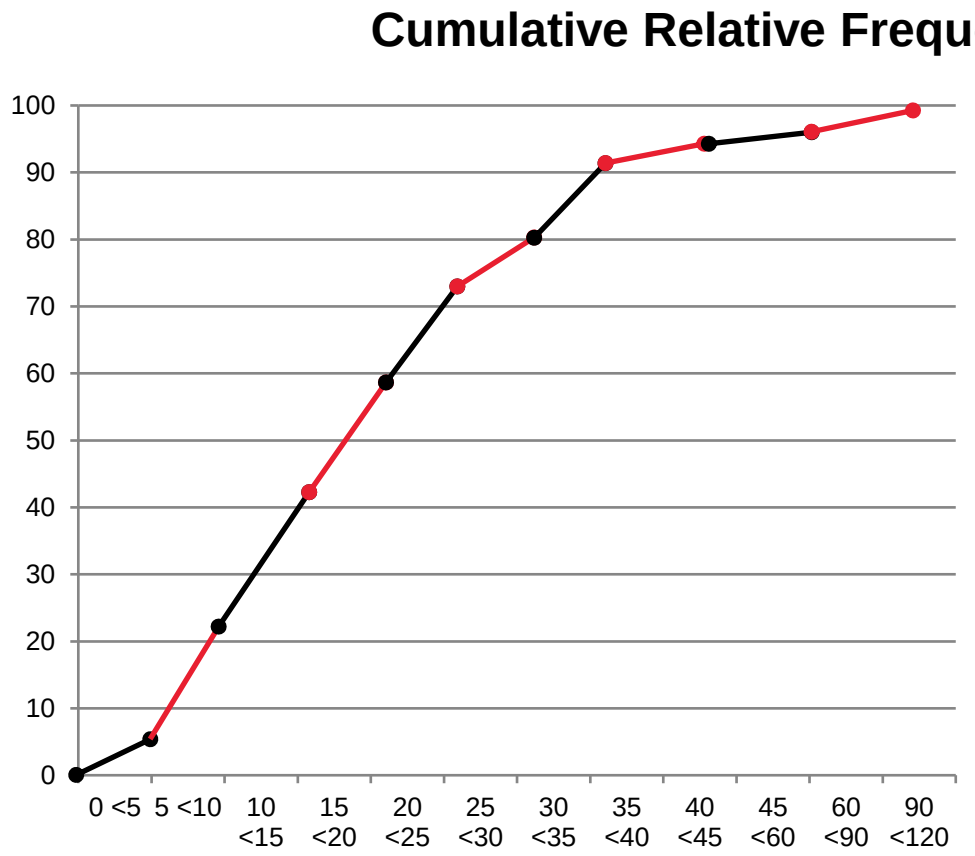
Use the graph below to answer the following questions.

- Was Barack Obama, who was inaugurated at age 47, unusually young?

- Estimate and interpret the 65th percentile of the distribution



Problem #3.28 from HW (p. 117)



Test Review HW #8 (Chapters 1, 2 and 3)

- Be ready for the 1st Test next week and bring your HW Notebook on test day!

- Start reading Chapter 4 this weekend!

Future Topics

Summary

In the NEXT section, we will learn that…

- ✓ There are two common ways of describing an individual's position or location within a distribution – the **percentile** and ***z*-score**.
- ✓ A **cumulative relative frequency graph** allows us to examine location within a distribution.
- ✓ It is common to **transform data**, especially when changing units of measurement. Transforming data can affect the shape, center, and spread of a distribution.
- ✓ We can sometimes describe the overall pattern of a distribution by a **density curve** (an idealized description of a distribution that smooths out the irregularities in the actual data).

Looking Ahead…

In the next Section…

We'll learn about one particularly important class of density curves – the **Normal Distributions**

We'll learn

- ✓**The 68-95-99.7 Rule**
- ✓**The Standard Normal Distribution**
- ✓**Normal Distribution Calculations, and**
- ✓**Assessing Normality**