

MAT 223, Discussion Questions 8.31

- Describe, or give an example, of the difference between a frequency distribution and a probability distribution.

frequency distribution is based on collected data and may be given in counts or %'s. a probability distribution is never given in counts; and may be based on a sample of theoretical considerations.

- Describe how to calculate a class for quantitative data.

find the range of the data. Determine the # of classes to be used. divide: $\frac{\text{max-min}}{\text{\# of classes}} = \text{class width}$. beginning of min, create class boundaries by adding multiples of class width until find value is accounted for. (place data in appropriate bins.)

- Use the data set on the age of presidents at inauguration and divide the data in 5 classes.

Hint: You will find it helpful to sort the data first.

President	AGE (in years)	President	AGE (in years)
George Washington	57.183566	Benjamin Harrison	55.5370
John Adams	61.3425	Grover Cleveland	55.9562
Thomas Jefferson	57.8904	William McKinley	54.0932
James Madison	58.9671	Theodore Roosevelt	42.8822
James Monroe	58.8493	William Howard Taft	51.4658
John Quincy Adams	57.6466	Woodrow Wilson	56.1808
Andrew Jackson	61.9699	Warren G. Harding	55.3342
Martin Van Buren	54.2438	Calvin Coolidge	51.0795
William Henry Harrison	68.0630	Herbert Hoover	54.5644
John Tyler	51.0164	Franklin D. Roosevelt	51.0904
James K. Polk	49.3342	Harry S. Truman	60.9288
Zachary Taylor	64.2740	Dwight D. Eisenhower	62.2685
Millard Fillmore	50.5014	John F. Kennedy	43.6466
Franklin Pierce	48.2767	Lyndon B. Johnson	55.2384
James Buchanan	65.8630	Richard Nixon	56.0301
Abraham Lincoln	52.0548	Gerald Ford	61.0712
Andrew Johnson	56.2932	Jimmy Carter	52.3041
Ulysses S. Grant	46.8521	Ronald Reagan	69.9479
Rutherford B. Hayes	54.4137	George H. W. Bush	64.6082
James A. Garfield	49.2877	Bill Clinton	46.4219
Chester A. Arthur	51.9562	George W. Bush	54.5425
Grover Cleveland	47.9616	Barack Obama	47.4630

→ min

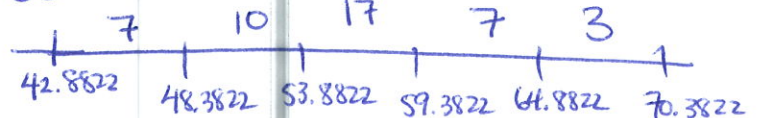
← max

range = 27.0657

class width for 5 classes

$\frac{27.0657}{5} = 5.41314$ round up to 5.5

Classes



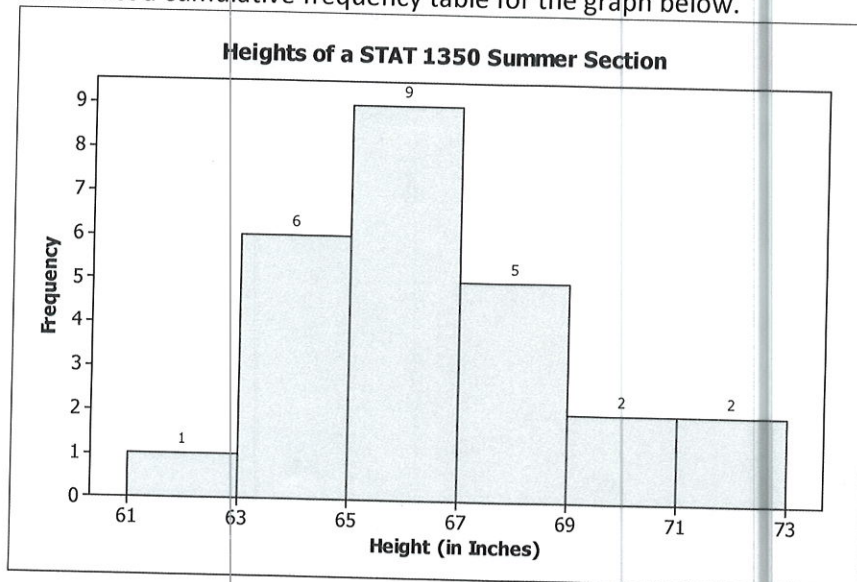
b. Find the midpoint of each class.

45.6322
 51.1322
 56.6322
 62.1322
 67.6322

3. Complete the frequency distribution table below, and convert it to a relative frequency. What kind of graph would be appropriate for this data?

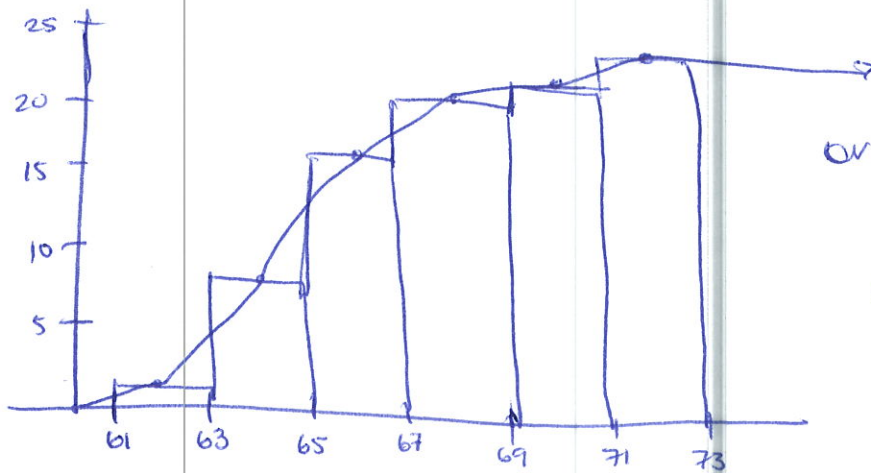
	<u>Class</u>	<u>Students</u>	<u>Percent (round to the nearest tenth)</u>
	Freshmen	8248	.268 or 26.8%
	Sophomore	8073	.262 or 26.2%
	Junior	7001	.227 or 22.8%
	Senior	6904	.224 or 22.4%
	Non-degree	535	.017 or 1.7%
	Total	30761	100%

4. Construct a cumulative frequency table for the graph below.



<u>Height</u>	<u>Cumulative Frequency</u>
61-62	1
63-64	7
65-66	16
67-68	21
69-70	23
71-72	25

Construct a cumulative frequency graph of the chart you created above.



5. Below is a table of a cumulative distribution function for tossing 4 coins and counting the number of heads in each toss. Convert this cumulative distribution to a probability distribution.

# of Heads	0	1	2	3	4
Probability ($X \leq x$)	$\frac{1}{16}$	$\frac{5}{16}$	$\frac{11}{16}$	$\frac{15}{16}$	1

($X = x$)

$$\frac{1}{16} \quad \frac{4}{16} = \frac{1}{4} \quad \frac{6}{16} = \frac{3}{8} \quad \frac{4}{16} = \frac{1}{4} \quad \frac{1}{16}$$

$\frac{5}{16} - \frac{1}{16}$ $\frac{11}{16} - \frac{5}{16}$ $\frac{15}{16} - \frac{11}{16}$ $\frac{16}{16} - \frac{15}{16}$

# of Heads	0	1	2	3	4
Probability ($X = x$)	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{16}$

6. Be prepared to discuss the article at <http://registerguard.com/rg/news/local/33381638-75/waiting-to-teach-math-miscalculates-young-minds-teacher-says.html.csp>.