MAT 135, Discussion Questions 1.25

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

frequency distribution gives a count
probability distribution gives a ratio or relative frequency

2. What are the steps to create a pie chart?

① convert frequencies to relative frequencies
② multiply relative frequencies by 360°
③ use a protractor to divide a circle into slices sized according to part ②

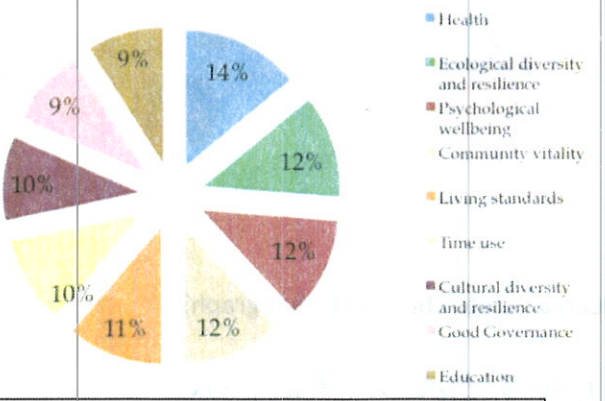
3. What kind of data can go into a pie chart?

Categorical data

4. Comment on the quality of the following pie charts. Are they good, bad or misused?

a.

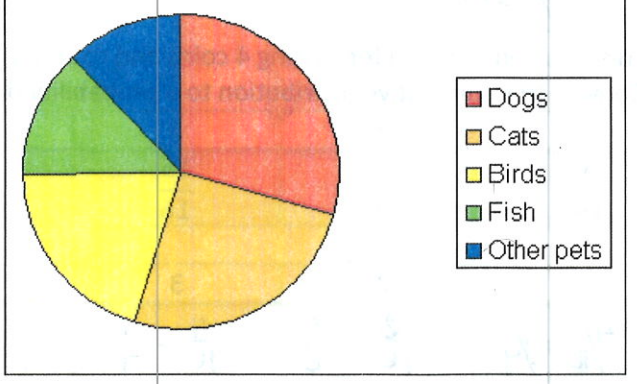
Figure 4: In which domains do happy people enjoy sufficiency?



bad
not part of a whole

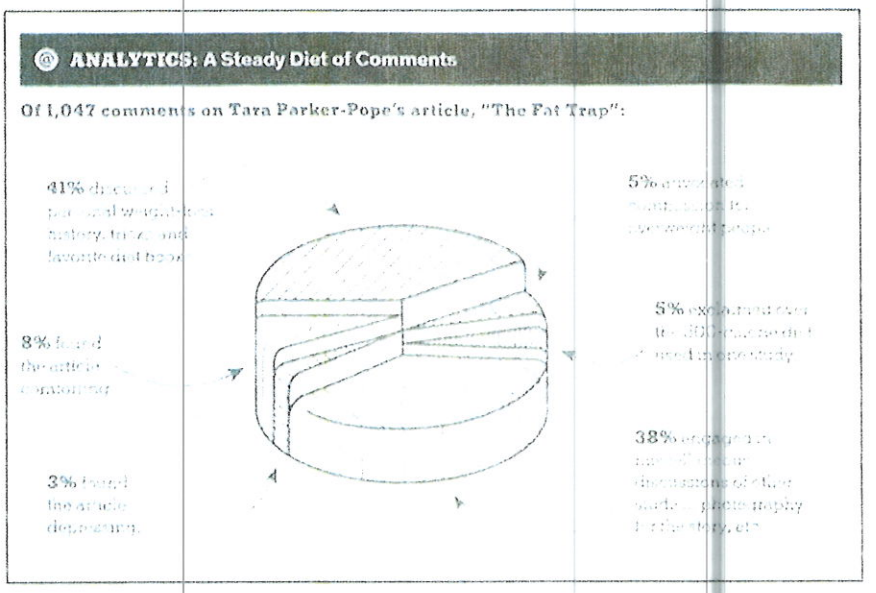
b.

Figure 4. Pets bought at World of Pets



ok, but labeling % would be easier to compare similar size sections

c.



bad
3D distorts

very bad
what is being measured?
some pies too small to see; some overlap

d.

5. What is the difference between a Pareto chart and a bar graph?

Pareto has bars ordered by size
highest frequency first

6. 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

# of Heads	0	1	2	3	4
Probability $(X = x)$	1/16	4/16 = 1/4	6/16 = 3/8	4/16 = 1/4	1/16

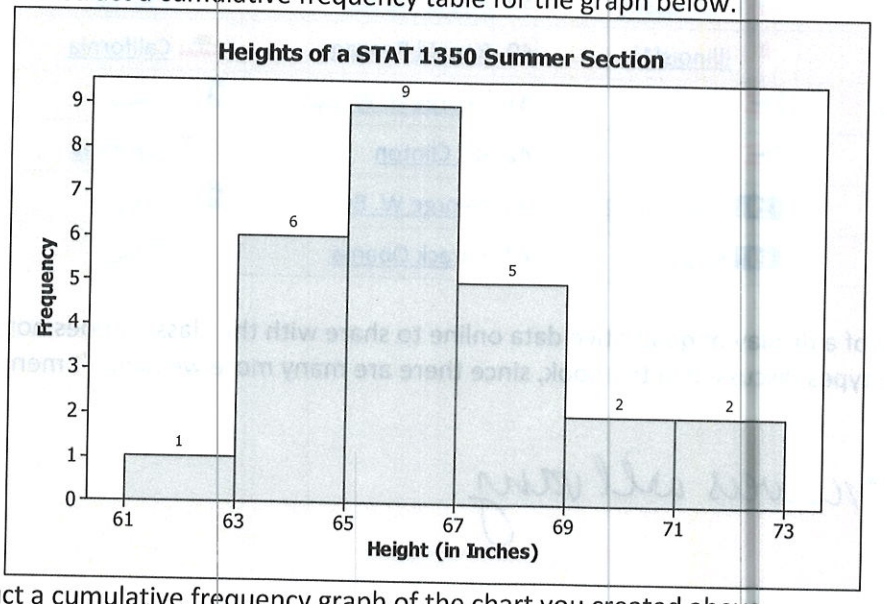
7. Complete the frequency distribution table below, and convert it to a relative frequency. What kind of graph would be appropriate for this data?

Class	Students	Percent (round to the nearest tenth)
Freshmen	8248	$\frac{8248}{30761} = 26.8\%$
Sophomore	8073	$\frac{8073}{30761} = 26.2\%$
Junior	7001	$\frac{7001}{30761} = 22.8\%$
Senior	6904	$\frac{6904}{30761} = 22.4\%$
Non-degree	535	$\frac{535}{30761} = 1.7\%$
Total	30761	100%

30226

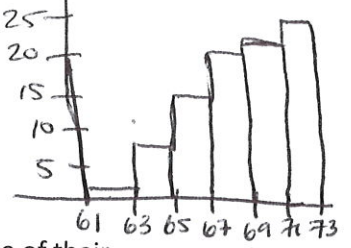
30761 − 30226 = 535

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



Class	Cum freq
61-63	1
63-65	7 = 1+6
65-67	16 = 7+9
67-69	21 = 16+5
69-71	23 = 21+2
71-73	25 = 23+2

Cum. bar graph



Or use ogive

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

9. The state affiliations of Presidents are shown in the table below by state (at the time of their elections, not their birth states).

#	President	State	#	President	State
1	George Washington	Virginia	23	Benjamin Harrison	Indiana
2	John Adams	Massachusetts	24	Grover Cleveland	New York

#	President	State	#	President	State
3	Thomas Jefferson	Virginia	25	William McKinley	Ohio
4	James Madison	Virginia	26	Theodore Roosevelt	New York
5	James Monroe	Virginia	27	William Howard Taft	Ohio
6	John Quincy Adams	Massachusetts	28	Woodrow Wilson	New Jersey
7	Andrew Jackson	Tennessee	29	Warren G. Harding	Ohio
8	Martin Van Buren	New York	30	Calvin Coolidge	Massachusetts
9	William Henry Harrison	Ohio	31	Herbert Hoover	California
10	John Tyler	Virginia	32	Franklin D. Roosevelt	New York
11	James K. Polk	Tennessee	33	Harry S. Truman	Missouri
12	Zachary Taylor	Louisiana	34	Dwight D. Eisenhower	Kansas
13	Millard Fillmore	New York	35	John F. Kennedy	Massachusetts
14	Franklin Pierce	New Hampshire	36	Lyndon B. Johnson	Texas
15	James Buchanan	Pennsylvania	37	Richard Nixon	California
16	Abraham Lincoln	Illinois	38	Gerald Ford	Michigan
17	Andrew Johnson	Tennessee	39	Jimmy Carter	Georgia
18	Ulysses S. Grant	Illinois[1]	40	Ronald Reagan	California
19	Rutherford B. Hayes	Ohio	41	George H. W. Bush	Texas
20	James A. Garfield	Ohio	42	Bill Clinton	Arkansas
21	Chester A. Arthur	New York[2]	43	George W. Bush	Texas
22	Grover Cleveland	New York	44	Barack Obama	Illinois

10. Find an example of a display of qualitative data online to share with the class. It does not need to be one of the types discussed in the book, since there are many more we haven't mentioned.

Answers will vary