Final answers should have accuracy to 6 decimal places. Show some work how medians and means are computed. *Giving only the answer will bring you few points.*

1. (8pts) The campaign of a mayoral candidate would like to find out how much support there is for the candidate and wishes to survey the population. Answer whether each of the following methods will produce a good, bad or questionable random sample and comment why.

a ☐ good Surveying visitors to a golf course.
  ☑ bad Would likely survey only some well-to-do people,
  ☐ iffy less likely to survey average earner

b ☑ good Surveying random people from the city's voter lists.
  ☐ bad Would probably capture a good cross-section of voters
  ☐ iffy

c ☐ good Surveying random people from the phone book.
  ☐ bad Would probably miss younger voters as they are
  ☑ iffy not likely to have a landline phone

d ☑ good Surveying shoppers as they exit Kohl's.
  ☐ bad Most people shop at Kohl's, so would probably
  ☐ iffy get a decent random sample.

2. (16pts) Below are grades from a College Algebra exam. Do the following:
a) Construct a grouped frequency distribution with first class 41–45.
b) Draw a histogram for the data
c) Enter a representative value for each interval.
d) Estimate the mean of the data based on the frequency distribution.

53, 70, 76, 82, 77, 63, 60, 78, 69, 99, 89, 43, 59, ⎱ 26 items
60, 97, 55, 65, 66, 74, 88, 73, 83, 83, 97, 68, 53 ⎰ total
73

Class	Frequency	Rep. value
41-45	1	43
46-50	0.	48
51-55	3	53
56-60	3	58
61-65	2.	63
66-70	4	68
71-75	3	73
76-80	3	78
81-85	3.	83
86-90	2	88
91-95	0	93
96-100	2	98

b)
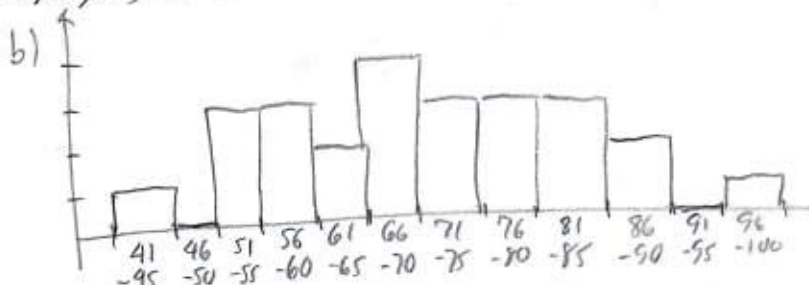
d) $\dfrac{1 \cdot 43 + 0 \cdot 48 + 3 \cdot 53 + 3 \cdot 58 + 2 \cdot 63 + \ldots + 0 \cdot 93 + 2 \cdot 98}{1 + 0 + 3 + 3 + 2 + \ldots + 0 + 1}$

$= \dfrac{1848}{26} = 71.076923$

3. (10pts) An amateur meteorologist examines over 12 months how many days in a month it rains over 0.25 in. The numbers are listed below.

a) Find the midrange of the data.   5, 7, 10, 12, 9, 11, 14, 9, 7, 12, 6, 4

b) Find the median of the data.   4, 5, 6, 7, 7, 9, 9, 10, 11, 12, 12, 14   (12 items)

c) Find the mean of the data.

a) midrange $= \dfrac{4+14}{2} = 9$

b) $\dfrac{12}{2} = 6$, need 6th and 7th items: 9, 9, so median $= \dfrac{9+9}{2} = 9$

c) $\bar{x} = \dfrac{5+7+10+\cdots+6+4}{12} = \dfrac{106}{12} = 8.833333$

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4. (20pts) Over a year, a movie theater tracks the weekly number of new releases. The numbers are shown below. Do the following:

a) Draw a histogram for the data.

b) Find the midrange of the data.

c) Find the mode of the data.

d) Find the median of the data.

e) Find the mean of the data.

a)

Weekly ~~releases~~ ~~arrests~~	Frequency (weeks)
0	4
1	7
2	12
3	15
4	10
5	4
	52

b) midrange $= \dfrac{0+5}{2} = 2.5$

c) mode $= 3$

d) $0, \to 0, 1, \to 1, 2, \to 2, 3, \to 3, 4, \to 4, 5, \to 5$

  4th · 11th · 23rd · 38th

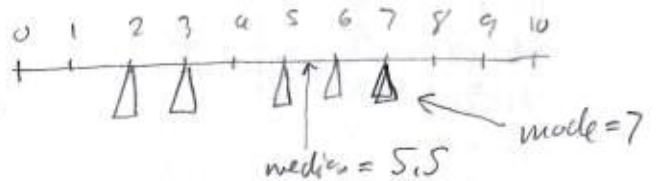52 items, $\dfrac{52}{2} = 26$, need 26th and 27th : 3, 3, so median $= \dfrac{3+7}{2} = 3$
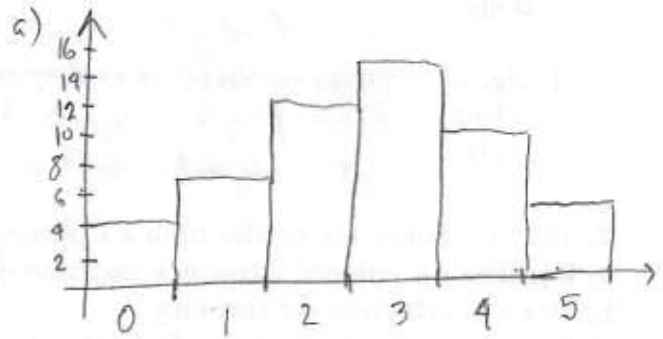
e) $\bar{x} = \dfrac{4\cdot 0 + 7\cdot 1 + 12\cdot 2 + 15\cdot 3 + 10\cdot 4 + 4\cdot 5}{52} = \dfrac{136}{52} = 2.615385$

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5. (6pts) Construct an example with six numbers 0–10, which satisfies the conditions below. Verify by stating the mean, median and mode for your example.

mean < median < mode

$5 < 5.5 < 7$

mode = 7

median = 5.5

2, 3, 5, 6, 7, 7

mean $= \dfrac{2+3+5+6+7+7}{6} = \dfrac{30}{6} = 5$ median $= \dfrac{5+6}{2} = 5.5$

mode = 7