

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 cemetery of a town has reached capacity, so city officials are considering expanding it into an area adjoining a residential neighborhood. The local newspaper would like to find out how much support there is for the idea and decides 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  bad  iffy  
 Surveying visitors to the cemetery.  
*Group may be biased toward expansion. Also, older people may be overrepresented in this group.*
- b  good  bad  iffy  
 Surveying random people from the phone book whose last names begin with A.  
*A family or an ethnic group may be overrepresented if we only choose people whose last names begin with A*
- c  good  bad  iffy  
 Surveying random people from the town's voter lists.  
*The best among the options — most likely to produce a random sample.*
- d  good  bad  iffy  
 Surveying residents of the neighborhood adjoining the proposed expansion.  
*Group may be biased against expansion*

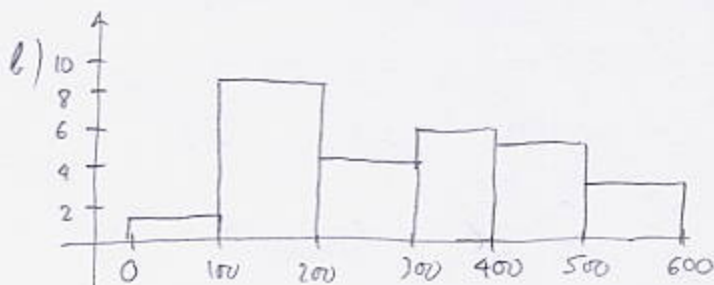
2. (22pts) A survey of 27 smartphones found the following prices without contract. Do the following:

- a) Construct a grouped frequency distribution with first class 0-99.  
 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.  
 e) Find the actual mean and compare your answer to e).

149, 129, 159, 165, 89, 599, 345, 299, 235, 109, 459, 325, 550, 449, 380, 249, 199, 333, 155, 175, 429, 359, 425, 445, 525, 259, 399

a)

Class	Frequency	Rep. value
0-99	1	$\frac{0+99}{2} = 49.5$
100-199	8	149.5
200-299	4	249.5
300-399	6	349.5
400-499	5	449.5
500-599	3	549.5
	<u>27</u>	



d)  $\bar{x} = \frac{49.5 \cdot 1 + 149.5 \cdot 8 + 249.5 \cdot 4 + \dots + 549.5 \cdot 3}{27} = \frac{8236.5}{27} = 305.055556 = \$305.06$  ← fairly close ↓

e)  $\bar{x} = \frac{149 + 129 + \dots + 259 + 399}{27} = \frac{8393}{27} = 310.851852 = \$310.85$

3. (10pts) A small business examines how many cars are parked in their parking lot over 15 days. They number listed below.

a) Find the midrange of the data.

3, 4, 7, 8, 5, 8, 4, 4, 8, 9, 11, 12, 3, 6, 6

b) Find the median of the data.

c) Find the mean of the data.

$$a) \text{ midrange} = \frac{3+12}{2} = \boxed{7.5}$$

15 items, need 8th ( $\frac{15}{2}$  rounded up)

$$b) \text{ 3, 3, 4, 4, 4, 5, 6, 6, 7, 8, 8, 8, 9, 11, 12}$$

↑ 8th

$$\text{median} = \boxed{6}$$

$$c) \bar{x} = \frac{3 \cdot 2 + 4 \cdot 3 + 5 + 6 \cdot 2 + 7 + 8 \cdot 3 + 9 + 11 + 12}{15} = \frac{98}{15} = \boxed{6.533333}$$

4. (20pts) Over a year, a small town police department tracks the number of weekly arrests. The numbers are shown below. Do the following:

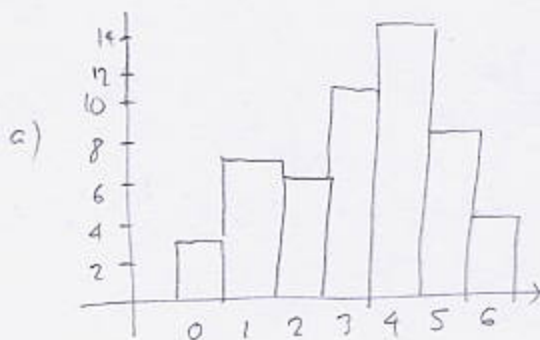
a) Draw a histogram for the data.

b) Find the midrange of the data.

c) Find the median of the data.

d) Find the mean of the data.

Weekly arrests	Frequency (weeks)
0	3
1	7
2	6
3	10
4	14
5	8
6	4
	52



$$b) \text{ midrange} = \frac{0+6}{2} = \boxed{3}$$

$$c) 0, \underset{\uparrow}{0}, 1, \underset{\uparrow}{1}, 2, \underset{\uparrow}{2}, 3, \underset{\uparrow}{3}, 4, \underset{\uparrow}{4}, 5, \underset{\uparrow}{5}, 6, \underset{\uparrow}{6}$$

2nd    10th    16th    26th 27th

$$\frac{52}{2} = 26, \text{ need 26th \& 27th}$$

$$\text{median} = \frac{3+4}{2} = \boxed{3.5}$$

$$d) \bar{x} = \frac{0 \cdot 3 + 1 \cdot 7 + 2 \cdot 6 + 3 \cdot 10 + 4 \cdot 14 + 5 \cdot 8 + 6 \cdot 4}{52}$$

$$= \frac{169}{52} = \boxed{3.25}$$