PRACTICE QUESTIONS FOR MESURES OF LOCATION (MEAN, MEDIAN, MODE)

EXERCISE 2.1

1. Find the mean, median and mode of the following sets of numbers.

(a) 109.4, 108.5, 103.1, 111.3, 121.2
(b) 10, 11, 13, 11, 15, 16
(c) 2, 5, 6, 3, 7, 8, 4, 12, 11, 9, 10, 7, 6, 8, 9, 7
$(Ans: (a)\ 110.7, 109.4, no\ mode \quad (b)\ 12.7, 12, 11 \quad (c)\ 7.125,\ 7, 7)$

2. Find the mean, median and mode of the given distribution
(a)

x	0	1	2	3	4	5	6
f	1	2	2	3	4	5	4

(b)

x	2	4	6	8	10	12
f	2	4	10	6	3	1

$(Ans: (a)\ 3.81,\ 4,\ 5 \quad (b)\ 6.54,\ 6,\ 6)$

3. The mean of six numbers is 41. Three of the numbers are 32, 31 and 42. The remaining three numbers each equals to *a*.

(a) Find the sum of the six numbers.
(b) Find the value of *a*.
$(Ans: 246,\ 47)$

4. The mean of three numbers x, y and z is 6 and the mean of five numbers *x,y,z,a and b* is 8. Find the mean of a and b.
$(Ans: 11)$

5. The average marks obtained by 10 students in Statistics are 114. If 9 students had marks 101, 125, 118, 128, 106, 115, 99, 118 and 109. What must be the marks of 10^{th} student?
$(Ans: 121)$

6. The median of a set of eight numbers is $4\frac{1}{2}$. Given that seven of the numbers are 9, 2, 3, 4, 12, 13 and 1. Find the eighth number.
$(Ans: 5)$

7. Marks of ten students in Elementary Statistics Course are given below

$$2,3,6,8,11,a,17,20,28,b$$

If mean of the marks is 1.4 and median is 13. Find the values of *a* and *b*.
$(Ans: a = 15, b = 30)$

8. **NFL Salaries** The salaries (in millions of dollars) for 31 NFL teams for a specific season are given in this frequency distribution

Class limits	Frequency
39.9–42.8	2
42.9–45.8	2
45.9–48.8	5
48.9–51.8	5
51.9–54.8	12
54.9–57.8	5

Source: NFL.com

Find mean, median, and mode for the data; and comment on the shape of the distribution.
(*Ans* : *Mean* = , *Median* = , *Mode* =)

9. **How Quick Are Older Dogs?** The animal trainer selected a group of dogs who were much older than the first group and measured their reaction times to the same stimulus.

Class limits	Frequency
2.3–2.9	1
3.0–3.6	3
3.7–4.3	4
4.4–5.0	16
5.1–5.7	14
5.8–6.4	4

Find mean, median, and mode for the data; and comment on the shape of the distribution.
(*Ans* : *Mean* = , *Median* = , *Mode* =)

10. A box contains five cards numbered 1,2,3,4 and 5. A card was drawn from the box, its number noted and then replaced. The process was repeated 100 times and the table shows the resulting frequency distribution.

Card	1	2	3	4	5
Frequency	21	x	y	18	17

(a) Show that $x + y = 44$.

(b) If the mean of the distribution is 2.9, show that $2x + 3y = 112$

(c) From (a) and (b) find the values of x *and* y, then state the mode and the median of the distribution.

(*Ans* : $x = 20,\ y = 24,\ \text{mode} = 3,\ median = 3$)

PRACTICE QUESTIONS FOR MESURES OF DISPERSION

EXERCISE 2.2

1. The following data set belongs to a population:

5, -7, 2, 0, -9, 16, 10, 7

Calculate the range, variance, and standard deviation.

$(Ans: range = 25,\ \text{var} = 70.28,\ s.d = 8.38)$

2. The following data give the number of patients who visited a walk-in clinic on each of 20 randomly selected days.

23, 37, 26, 19, 33, 22, 30, 42, 24, 26, 28, 32, 37, 29, 38, 24, 35, 20, 34, 38

(a) Calculate the range, variance, and standard deviation for these data.
(b) Calculate the mean deviation.

$(Ans: range = 23,\ \text{var} = 45.61,\ s.d = 6.75,\ MD = \quad)$

3. The following data give the one-way commuting times (in minutes) from home to work for all 12 employees working at a small company.

35, 10, 22, 38, 31, 27, 53, 44, 16, 44, 25, 12

(a) Calculate the range, variance, and standard deviation for these data.
(b) Calculate the mean deviation.

$(Ans: range = 43,\ \text{var} = 184.38,\ s.d = 13.58,\ MD = \quad)$

4. If $y = 2x + 5$ $\bar{y} = 33$ and $\text{var}(x) = 2$ also $p = x + 3,\ q = x - 7$ *and* $r = \frac{1}{2}x + 8$

then find the following

(a) $\bar{p}, \bar{q}$ *and* $\bar{r}$

(b) $\text{var}(p), \text{var}(q)$ *and* $\text{var}(r)$

(c) $sd(2p), sdr(3q)$ *and* $sd(5r)$

$(Ans: (a) \quad , (b) \quad , (c) \quad)$

5. The following data give the prices of seven textbooks randomly selected from a university bookstore.

$89, $170, $104, $113, $56, $161, $147

(a) Find the mean for these data. Calculate the deviations of the data values from the mean. Is the sum of these deviations zero?

(b) Calculate the range, variance, standard deviation and mean deviation.

$(Ans: mean = 120,\ range = 114,\ \text{var} = 1712,\ s.d = 41.38,\ MD = \quad)$

6. Find the variance , standard deviation and mean deviation of the given distribution

(a)

x	0	1	2	3	4	5	6
f	1	2	2	3	4	5	4

(b)

x	2	4	6	8	10	12
f	2	4	10	6	3	1

$(Ans: \text{var} = \quad , sd = \quad , MD = \quad)$

7. **NFL Salaries** The salaries (in millions of dollars) for 31 NFL teams for a specific season are given in this frequency distribution

Class limits	Frequency
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42.9–45.8	2
45.9–48.8	5
48.9–51.8	5
51.9–54.8	12
54.9–57.8	5

Source: NFL.com

Find variance, standard deviation, and mean deviation for the data;

$(Ans: \text{var} = \quad , sd = \quad , MD = \quad)$

8. **How Quick Are Older Dogs?** The animal trainer selected a group of dogs who were much older than the first group and measured their reaction times to the same stimulus.

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Find variance , standard deviation and mean deviation for the data;

$(Ans: \text{var} = \quad , sd = \quad , MD = \quad)$

9. The following data give the prices of seven textbooks randomly selected from a university bookstore.

$89, $170, $104, $113, $56, $161, $147

Calculate the coefficient of variation.

$(Ans: CV = \quad)$

10. Consider the following two data sets. 120

Data Set I: 12, 25, 37, 8, 41 and Data Set II: 19, 32 44 15 48

Note that each value of the second data set is obtained by adding 7 to the corresponding value of the first data set

(a) Calculate the coefficient of variation of for both data sets and comment which data set has larger relative variation

(b) Can we calculate mean and standard deviation of second data set on the basis of first data on the basis of relation between them.

$(Ans: mean\,DS-1 = 24.6,\ s.d\ DS-1 = 14.64,\ CV\ DS-1 = 59.51)$

$(Ans: mean\,DS-2 = 31.60,\ s.d\ DS-2 = 14.64,\ CV\ DS-2 = 46.33)$