

## Learning Plan 08

### Question 1

31% of American adults surveyed stated that giving up their phone for a day would be more difficult than giving up their significant other.

In 2012, the United States population over the age of 18 was approximately 240,210,000.

According to recent research, 91% of all American adults have cell phones of some type.

Determine the number of American adults who would find giving up their phone more difficult than giving up their partner.

### Solution

$$0.91 \cdot 240,210,000 = 218,591,100$$

$$0.31 \cdot 218,591,100 = 67,763,241$$

### Question 2

Fifty million of 94 million households watched the last episode of a popular television show. What percentage of the households were not watching the show?

### Solution

$$94 - 50 = 44$$

$$44 \div 94 = 0.468.. = 46.8\%$$

### Question 3

A questionnaire was given to students. The first question asked was “How stressed have you been in the last week on a scale of 0 to 10 with 0 being not stressed at all and 10 being as stressed as possible?”

Stress Rating	Frequency
0	5
1	7
2	4
3	8
4	12
5	27
6	13
7	22
8	13
9	15
10	7

- a. Which stress rating describes the least number of students?
- b. How many students responded to this rating?

Solution

- a. 2 (because it has the smallest frequency)
- b. 4

Question 4

To find the frequency of each data value, you have to find how many times each value repeats.

Question 5

To find the frequency value for each class, you have to count how many numbers belong to each class.

How to Construct a Stem-and-Leaf Plot

12, 15, 16, 23, 25, 27, 27, 30, 33, 41

Split each number into “stem” and “leaf”. (The left digit will be the “stem”, and the right digit will be the “Leaf”

Stem	Leaves	
1	2, 5, 6	The first row has the numbers 12, 15, 16
2	3, 5, 7, 7	The second row has the numbers 23, 25, 27, 27
3	0, 3	The third row has the numbers 30, 33
4	1	The fourth row has the number 41

Question 12

Find the mean for the group of data items.

91, 95, 99, 97, 93, 95

Solution

$$\frac{91 + 95 + 99 + 97 + 93 + 95}{6} = \frac{570}{6} = 95$$

### Calculating the Mean for a Frequency Distribution

$$\text{Mean} = \bar{x} = \frac{\sum xf}{n},$$

where  $x$  represents a data value.

$f$  represents the frequency of that data value.

$\sum xf$  represents the sum of all the products obtained by multiplying each data value by its frequency.

$n$  represents the total frequency of the distribution.

### Question 13

Find the mean for the data items in the given frequency distribution.

Score, $x$	1	2	3	4	5	6	7	8
Frequency, $f$	1	1	2	6	4	3	4	2

### Solution

$$\text{Mean} = \frac{1 \cdot 1 + 2 \cdot 1 + 3 \cdot 2 + 4 \cdot 6 + 5 \cdot 4 + 6 \cdot 3 + 7 \cdot 4 + 8 \cdot 2}{1 + 1 + 2 + 6 + 4 + 3 + 4 + 2} = 5$$

### Question 14

Find the median for the group of data items.

91, 95, 99, 97, 93, 95

### Solution

First arrange the data items from smallest to largest.

91, 93, 95, 95, 97, 99

The number of data items is even, so the median is the mean of the two middle data items.

$$\text{Median} = \frac{95 + 95}{2} = 95$$

### Question 15

Find the median for the data items in the given frequency distribution.

Score, x	1	2	3	4	5	6	7	8
Frequency, f	1	5	3	5	2	3	3	4

#### Solution

To solve this problem, you can use the formula on page 784 in the textbook, but if that seems difficult, just write down all the numbers, and find the median:

1, 2, 2, 2, 2, 2, 3, 3, 3, 4, 4, 4, 4, 4, 5, 5, 6, 6, 6, 6, 7, 7, 7, 7, 8, 8, 8, 8

The middle two numbers are 4 and 4.

$$\text{Median} = \frac{4 + 4}{2} = 4$$

### Question 16

Find the mode for the group of data items. If there is no mode, so state.

91, 95, 99, 97, 93, 95

#### Solution

The mode is 95. (Because it repeats the most)

### Question 17

Find the midrange for the group of data items.

93, 94, 95, 99, 98, 94

#### Solution

$$\text{Midrange} = \frac{\text{lowest data value} + \text{highest data value}}{2}$$

$$= \frac{93 + 99}{2}$$

$$= 96$$

### Question 19

Find the grade point average. Assume that the grade point values are 4.00 for an A, 3.00 for a B, and so on.

Grades	# of credit hours
B	4
B	2
B	5
C	2

### Solution

So,

$$A = 4.00$$

$$B = 3.00$$

$$C = 2.00$$

$$D = 1.00$$

$$F = 0.00$$

The total number of credit hours:

$$4 + 2 + 5 + 2 = 13$$

The Grade Point Average:

$$\frac{4 \cdot 3 + 2 \cdot 3 + 5 \cdot 3 + 2 \cdot 2}{13} = \frac{37}{13} \approx 2.85$$