

## Answer on Question #81459 – Math – Statistics and Probability

Consider the following population test scores for a class:

99, 100, 62, 75, 81, 68, 74, 86, 79, 91, 77, 82, 96, 84, 71

a. Compute:

**Question**

mean

**Solution**

$$\mu = \frac{1}{n} \sum_{i=1}^n x_i$$
$$\mu = \frac{99 + 100 + 62 + 75 + 81 + 68 + 74 + 86 + 79 + 91 + 77 + 82 + 96 + 84 + 71}{15}$$
$$\mu = \frac{245}{3} \approx 81.6667$$

**Question**

median

**Solution**

Median will be the middle element of the sorted list  
62, 68, 71, 74, 75, 77, 79, 81, 82, 84, 86, 91, 96, 99, 100  
median = 81

**Question**

mode

**Solution**

62, 68, 71, 74, 75, 77, 79, 81, 82, 84, 86, 91, 96, 99, 100

Since each value occurs only once in the data set, there is no mode for this set of data.

**Question**

standard deviation

### Solution

$$\sigma = \sqrt{\frac{1}{n} \sum_{i=1}^n (x_i - \mu)^2}$$
$$\sigma = 11.2546$$

### Question

b. Determine  
P80

### Solution

$$z = 0.8418$$
$$P80 = \mu + \sigma z$$
$$P80 = \frac{245}{3} + 11.2546(0.8418) = 91.1408$$

### Question

P90

### Solution

$$z = 1.2817$$
$$P80 = \mu + \sigma z$$
$$P80 = \frac{245}{3} + 11.2546(1.2817) = 96.0917$$

### Question

c. Calculate the interquartile range

### Solution

62, 68, 71, 74, 75, 77, 79, 81, 82, 84, 86, 91, 96, 99, 100

$$\text{First quartile: } \frac{1}{4}(n + 1) = \frac{1}{4}(15 + 1) = 4$$

$$x_4 = 74$$

$$\text{Third quartile: } \frac{3}{4}(n + 1) = \frac{3}{4}(15 + 1) = 12$$

$$x_{12} = 91$$

The interquartile range = Third quartile – First quartile

$$x_{12} - x_4 = 91 - 74 = 17$$

The interquartile range: 17.