

1. Solution

Let x represent a datum of interest. Let i represent that datum's index. Let ℓ represent that datum's percentile. Let n represent the sample size (number of measurements). In general,

$$\ell = \frac{i}{n}$$

(a) We are given $x = 90.209$. This means $i = 2$. We know $n = 9$. Determine the percentile ℓ .

$$\ell = \frac{2}{9}$$

$$\ell = 0.222$$

So, the percentile rank is $\boxed{0.222}$, or 22.2th percentile.

(b) We are given $\ell = 0.667$. We can use algebra to solve for i .

$$\ell = \frac{i}{n}$$

Multiply both sides by n .

$$n \cdot (\ell) = n \cdot \left(\frac{i}{n} \right)$$

Simplify both sides.

$$n\ell = i$$

To make me happy, switch the sides.

$$i = n\ell$$

Now, we can evaluate i .

$$i = (9)(0.667)$$

$$i = 6$$

Determine the x associated with $i = 6$.

$$x = \boxed{92.475}$$

(c) The mean: $\bar{x} = \frac{826.457}{9} = \boxed{91.829}$

(d) If n is odd, then median is $x_{i=\frac{n+1}{2}}$, the value of x when $i = \frac{n+1}{2}$. Otherwise, if n is even, the median is mean of $x_{i=\frac{n}{2}}$ and $x_{i=\frac{n}{2}+1}$. In this case, $n = 9$ and so n is odd.

$$\text{median} = x_{(9+1)/2} = x_5$$

So, median = $\boxed{92.348}$.

2. Solution

Let x represent a datum of interest. Let i represent that datum's index. Let ℓ represent that datum's percentile. Let n represent the sample size (number of measurements). In general,

$$\ell = \frac{i}{n}$$

(a) We are given $x = 91.27$. This means $i = 11$. We know $n = 72$. Determine the percentile ℓ .

$$\ell = \frac{11}{72}$$

$$\ell = 0.153$$

So, the percentile rank is $\boxed{0.153}$, or 15.3th percentile.

(b) We are given $\ell = 0.583$. We can use algebra to solve for i .

$$\ell = \frac{i}{n}$$

Multiply both sides by n .

$$n \cdot (\ell) = n \cdot \left(\frac{i}{n} \right)$$

Simplify both sides.

$$n\ell = i$$

To make me happy, switch the sides.

$$i = n\ell$$

Now, we can evaluate i .

$$i = (72)(0.583)$$

$$i = 42$$

Determine the x associated with $i = 42$.

$$x = \boxed{94.272}$$

(c) The mean: $\bar{x} = \frac{6844.788}{72} = \boxed{95.066}$

(d) If n is odd, then median is $x_{i=\frac{n+1}{2}}$, the value of x when $i = \frac{n+1}{2}$. Otherwise, if n is even, the median is mean of $x_{i=\frac{n}{2}}$ and $x_{i=\frac{n}{2}+1}$. In this case, $n = 72$ and so n is even.

$$\text{median} = \frac{x_{36} + x_{37}}{2} = \frac{93.887 + 94.05}{2}$$

So, median = $\boxed{93.9685}$.