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 $x = 43.569$. This means $i = 5$. We know $n = 11$. Determine the percentile ℓ.

$$\ell = \frac{5}{11}$$

$$\ell = 0.455$$

So, the percentile rank is $\boxed{0.455}$, or 45.5th percentile.

(b) We are given $\ell = 0.727$. 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.

$$i = (11)(0.727)$$

$$i = 8$$

Determine the x associated with $i = 8$.

$$x = \boxed{44.227}$$

(c) The mean: $\bar{x} = \frac{479.54}{11} = \boxed{43.595}$

(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, $n = 11$ and so n is odd.

$$\text{median} = x_{(11+1)/2,} = x_6$$

So, median = $\boxed{43.736}$.

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 $x = 83.739$. This means $i = 9$. We know $n = 35$. Determine the percentile ℓ.

$$\ell = \frac{9}{35}$$

$$\ell = 0.257$$

So, the percentile rank is $\boxed{0.257}$, or 25.7th percentile.

(b) We are given $\ell = 0.343$. 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.

$$i = (35)(0.343)$$

$$i = 12$$

Determine the x associated with $i = 12$.

$$x = \boxed{87.356}$$

(c) The mean: $\bar{x} = \frac{3204.053}{35} = \boxed{91.544}$

(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, $n = 35$ and so n is odd.

$$\text{median} = x_{(35+1)/2,} = x_{18}$$

So, median = $\boxed{93.2}$.