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 $x = 21.349$. This means $i = 4$. We know $n = 11$. Determine the percentile ℓ.

   $$\ell = \frac{4}{11}$$

   $$\ell = 0.364$$

   So, the percentile rank is $\boxed{0.364}$, or 36.4th percentile.

   (b) We are given $\ell = 0.818$. 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.

   $$i = (11)(0.818)$$

   $$i = 9$$

   Determine the x associated with $i = 9$.

   $$x = \boxed{29.714}$$

   (c) The mean: $\bar{x} = \frac{272.081}{11} = \boxed{24.735}$

   (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 = $\boxed{21.941}$.

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 $x = 85.313$. This means $i = 25$. We know $n = 56$. Determine the percentile ℓ.

   $$\ell = \frac{25}{56}$$

   $$\ell = 0.446$$

   So, the percentile rank is $\boxed{0.446}$, or 44.6th percentile.

   (b) We are given $\ell = 0.839$. 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.

   $$i = (56)(0.839)$$

   $$i = 47$$

   Determine the x associated with $i = 47$.

   $$x = \boxed{88.578}$$

   (c) The mean: $\bar{x} = \frac{4781.671}{56} = \boxed{85.387}$

   (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, $n = 56$ and so n is even.

   $$\text{median} = \frac{x_{28} + x_{29}}{2} = \frac{85.612 + 85.665}{2}$$

   So, median $= \boxed{85.6385}$.