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 $x = 59.556$. This means $i = 1$. We know $n = 11$. Determine the percentile ℓ.

   $$\ell = \frac{1}{11}$$

   $$\ell = 0.0909$$

   So, the percentile rank is $\boxed{0.0909}$, or 9.09th percentile.

   (b) We are given $\ell = 0.545$. 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.

   $$i = (11)(0.545)$$
   $$i = 6$$

   Determine the x associated with $i = 6$.

   $$x = \boxed{77.342}$$

   (c) The mean: $\bar{x} = \frac{806.447}{11} = \boxed{73.313}$

   (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 $= \boxed{77.342}$.

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 $x = 14.301$. This means $i = 12$. We know $n = 24$. Determine the percentile ℓ.

   $$\ell = \frac{12}{24}$$

   $$\ell = 0.5$$

   So, the percentile rank is $\boxed{0.5}$, or 50th percentile.

   (b) We are given $\ell = 0.417$. 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.

   $$i = (24)(0.417)$$
   $$i = 10$$

   Determine the x associated with $i = 10$.

   $$x = \boxed{14.123}$$

   (c) The mean: $\bar{x} = \frac{362.237}{24} = \boxed{15.093}$

   (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, $n = 24$ and so n is even.

   $$\text{median} = \frac{x_{12} + x_{13}}{2} = \frac{14.301 + 14.981}{2}$$

   So, median = $\boxed{14.641}$.