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 $x = 11.594$. This means $i = 4$. We know $n = 6$. Determine the percentile ℓ.

$$\ell = \frac{4}{6}$$

$$\ell = 0.667$$

   So, the answer is 0.667, or 66.7%.

   (b) We are given $\ell = 0.167$. 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.

$$i = (6)(0.167)$$

$$i = 1$$

   Determine the x associated with $i = 1$.

$$x = 11.195$$

   (c) The mean is $\frac{69.309}{6} = 11.5515$

   (d) If n is odd, then median is $x_{\frac{n+1}{2}}$, the value of x when $i = \frac{n+1}{2}$. Otherwise median is mean of $x_{\lfloor \frac{n+1}{2} \rfloor}$ and $x_{\lceil \frac{n+1}{2} \rceil}$. So, median = 11.53.

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 $x = 23.719$. This means $i = 15$. We know $n = 40$. Determine the percentile ℓ.

$$\ell = \frac{15}{40}$$

$$\ell = 0.375$$

So, the answer is 0.375, or 37.5%.

(b) We are given $\ell = 0.5$. 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.

$$i = (40)(0.5)$$

$$i = 20$$

Determine the x associated with $i = 20$.

$$x = 24.059$$

(c) The mean is $\frac{952.628}{40} = 23.816$

(d) If n is odd, then median is $x_{\frac{n+1}{2}}$, the value of x when $i = \frac{n+1}{2}$. Otherwise median is mean of $x_{\lfloor \frac{n+1}{2} \rfloor}$ and $x_{\lceil \frac{n+1}{2} \rceil}$. So, median = 24.084.