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 $x = 30.209$. This means $i = 1$. We know $n = 10$. Determine the percentile ℓ.

   $$\ell = \frac{1}{10}$$

   $$\ell = 0.1$$

   So, the answer is 0.1, or 10%.

   (b) We are given $\ell = 0.8$. 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.

   $$i = (10)(0.8)$$
   $$i = 8$$

   Determine the x associated with $i = 8$.

   $$x = 31.674$$

   (c) The mean is $\frac{317.14}{10} = 31.714$

   (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 = 31.4545.

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 $x = 14.83$. This means $i = 28$. We know $n = 32$. Determine the percentile ℓ.

$$\ell = \frac{28}{32}$$

$$\ell = 0.875$$

So, the answer is 0.875, or 87.5%.

(b) We are given $\ell = 0.344$. 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.

$$i = (32)(0.344)$$

$$i = 11$$

Determine the x associated with $i = 11$.

$$x = 10.754$$

(c) The mean is $\frac{394.054}{32} = 12.314$

(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 = 12.268.