

## **Calculating Percentiles Statistics**

 $\boldsymbol{P}_{p}$  is the  $p^{th}$  percentile of the data

 $L_p$  is the locator variable for  $P_p$ 

 $oldsymbol{n}$  is the size of the data set

 $L_p = (n + 1) \times \frac{p}{100}$  (the location of  $P_p$  within the data set)

For the ordered data set 1.7 12 12 15 15 19 n = 7.

Example 1: The 75<sup>th</sup> percentile, P<sub>75</sub>, is found as follows:

$$L_{75} = (7 + 1) \times \frac{75}{100} = (8) \times 0.75 = 6$$
 A WHOLE NUMBER

1 7 12 12 15 15 19 Since 15 is the  $6^{th}$  element, then  $P_{75} = 15$ .

Example 2: The 30<sup>th</sup> percentile, P<sub>30</sub>, is found as follows:

$$L_{30} = (7 + 1) \times \frac{30}{100} = (8) \times 0.3 = 2.4 =$$

$$\begin{array}{c}
2 + 0.4 & \underline{A \ DECIMAL \ NUMBER} \\
2^{nd} & 40\% \ of \ the \ way \ from \\
element & the 2^{nd} \ to 3^{rd} \ element
\end{array}$$

2.4 is between the 2<sup>nd</sup> element and the 3<sup>rd</sup> element

1 7 12 12 15 15 19

$$P_{30} = 2^{nd}$$
 element +  $[0.4 \times (3^{rd})]$  =  $7 + [(0.4) \times (12 - 7)]$  =  $7 + [0.4 \times (5)]$  =  $7 + 2$  =  $9$ 

Therefore,  $P_{30} = 9$ .

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