1.9 Describing Location in a Distribution (Part 1)

One way to describe a location of a piece of data in the distribution is to calculate the **percentile**.

An individual's **percentile** is the percent of values in a distribution that are less than the individual's data value.

BE CAREFUL WITH YOUR LANGUAGE WHEN DESCRIBING PERCENTILES!!
Percentiles are specific locations in a distribution, so an observation isn't "in" the 84th percentile. Rather, it is "at" the 84th percentile.

A high percentile is not always a good thing. For example, a man whose blood pressure is at the 90th percentile for his age group may need treatment for his high blood pressure!

Example: Refer to the dotplot to answer the following questions.
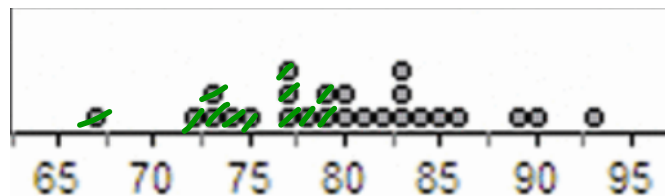
a.) Find the percentile for Norman, who scored 72.

$$\frac{1}{25} = 0.04 = 4$$

Norman is at the 4th percentile.

b.) Maria's test score is at the 48th percentile of the distribution. Interpret this value in context. What score did Maria earn?

$$(0.48)(25) = 12$$

There are 12 pieces of data below Maria.

Maria made an 80.

Example: Below is the number of students suspended in the Tri-City School District for each of the past 12 weeks.

3 5 6 6 7 9 9 10 11 12 14 15
15, 9, 12, 11, 7, 6, 9, 10, 14, 3, 6, 5

a.) Find the percentile for 7.

$$\frac{1}{12} = 0.08333\ldots \approx 8$$

7 is at the 8th percentile

b.) What number is at the first quartile of the data?

25% = 0.25

$$(0.25)(12) = 3$$

6 is at the first quartile.

Example: The following data gives the number of runners left on bases by each of the 30 MLB teams in the games played on August 12, 2004.

3 4 4 5 5 5 5 5 6 6 6 6 6 6 7 7 8 8 8 8 8 9 9 10 10 11 13 18
6, 7, 8, 6, 18, 8, 6, 11, 8, 7, 6, 5, 6, 9, 5, 10, 4, 5, 6, 8, 13, 3, 9, 8, 6, 5, 8, 5, 10, 4

a.) Find the percentile for 10.

$$\frac{2}{30} = 0.0666\ldots \approx 7$$

10 is at the 7th percentile.

b.) What number is at the third quartile of the data?

75% = 0.75

$$(0.75)(30) = 22.5$$

8 is at the third quartile.