

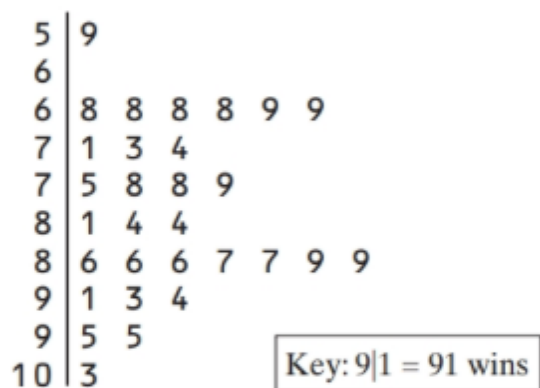
Given Two Solved Examples. Review these examples thoroughly before you start your assignment on the second page.

Wins in Major League Baseball

Finding and interpreting percentiles

PROBLEM:

The stemplot below shows the number of wins for each of the 30 Major League Baseball teams in 2016.



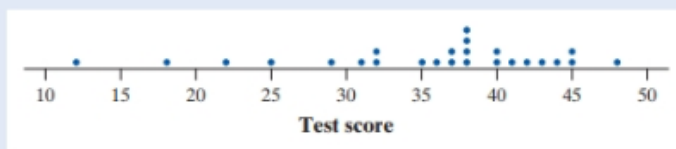
- (a) Find the percentile for the Detroit Tigers, who had 86 wins.
- (b) The number of wins for the Cleveland Indians is at the 90th percentile of the distribution. Interpret this value in context. How many wins did the Cleveland Indians have in 2016?

SOLUTION:

(a) $20/30 = 0.67$, so the Detroit Tigers were at the 67th percentile for this season. *Note:* There are three teams with 86 wins, and all of them are at the 67th percentile.

(b) 90% of the teams have a number of wins less than or equal to the Cleveland Indians. Because $(0.90)(30) = 27$, the number of wins for the Cleveland Indians was greater than or equal to that for 27 of the 30 teams. The Cleveland Indians had 94 wins in the 2016 season.

PROBLEM: Refer to the dotplot of 25 scores on Mr. Tabor's first statistics test.



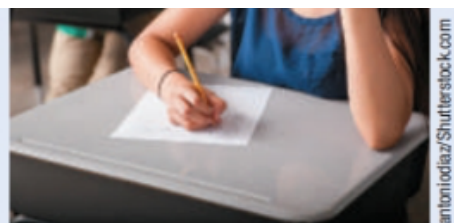
- (a) Find the percentile for Jacob, who scored 18 on the test.
- (b) Maria's test score is at the 48th percentile of the distribution. Interpret this value in context. What score did Maria earn?

SOLUTION:

- (a) $2/25 = 0.08$, so Jacob scored at the 8th percentile on this test.
- (b) 48% of students in the class earned a test score less than or equal to Maria's. Because $(0.48)(25) = 12$, Maria scored greater than or equal to 12 of the 25 students. Maria earned a 37 on the test.

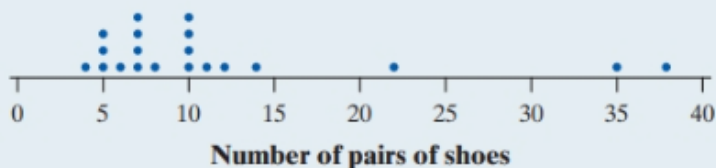
Only 2 of the 25 scores in the class are less than or equal to Jacob's 18.

Two students in the class scored a 37 on the test. Both these students' scores are at the 48th percentile because 12 of the 25 students in the class earned equal or lower scores.



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1. **Shoes** How many pairs of shoes does a typical teenage boy own? To find out, two AP[®] Statistics students surveyed a random sample of 20 male students from their large high school. Then they recorded the number of pairs of shoes that each boy owned. Here is a dotplot of the data:



- (a) Find the percentile for Jackson, who reported owning 22 pairs of shoes.
- (b) Raul's reported number of pairs of shoes is at the 45th percentile of the distribution. Interpret this value. How many pairs of shoes does Raul own?
2. **Old folks** Here is a stemplot of the percents of residents aged 65 and older in the 50 states:

7	0
8	8
9	8
10	0 1 9
11	1 6 7 7 7
12	0 1 1 2 2 4 5 6 7 7 8 9 9 9
13	0 0 0 1 2 2 3 3 3 4 4 4 5 5 6 8 9
14	0 2 3 5 6 8
15	2 4
16	9

Key: 15|2 means 15.2% of this state's residents are 65 or older.

- (a) Find the percentile for Colorado, where 10.1% of the residents are aged 65 and older.
- (b) Rhode Island is at the 80th percentile of the distribution. Interpret this value. What percent of Rhode Island's residents are aged 65 and older?
3. **Wear your helmet!** Many athletes (and their parents) worry about the risk of concussions when playing sports. A football coach plans to obtain specially made helmets for his players that are designed to reduce the chance of getting a concussion. Here are the

measurements of head circumference (in inches) for the players on the team:

23.0	22.2	21.7	22.0	22.3	22.6	22.7	21.5
22.7	25.6	20.8	23.0	24.2	23.5	20.8	24.0
22.7	22.6	23.9	22.5	23.1	21.9	21.0	22.4
23.5	22.5	23.9	23.4	21.6	23.3		

- (a) Antawn, the team's starting quarterback, has a head circumference of 22.4 inches. What is Antawn's percentile?
- (b) Find the head circumference of the player at the 90th percentile of the distribution.

(Hint: Draw a dot plot)

- 7. Growth charts** We used an online growth chart to find percentiles for the height and weight of a 16-year-old girl who is 66 inches tall and weighs 118 pounds. According to the chart, this girl is at the 48th percentile for weight and the 78th percentile for height. Explain what these values mean in plain English.

PS. Make sure you do the assignment by yourself. You may expect to have quiz on this soon. :)