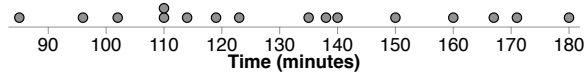
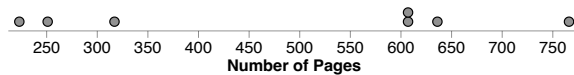


1. Using a sleep-tracking app, two new parents track the length of time, in minutes, that their newborn baby sleeps uninterrupted from the time they put the baby to sleep at night until the baby wakes. The results for the first 16 days are shown in the dotplot.



- a. The value of 119 is at what percentile?
- b. Which value is at the 75th percentile?
2. The dotplot shows the number of pages in each of the seven books in the Harry Potter book series, written by J.K. Rowling. The distribution of number of pages has a mean of 486.7 pages and a standard deviation of 217.2 pages.



- a. The book Harry Potter and the Prisoner of Azkaban is 317 pages long. Calculate and interpret the percentile for this book. Round to the nearest whole number.
- b. Calculate and interpret the z -score for Harry Potter and the Prisoner of Azkaban. Round to the nearest hundredth.
- c. The book, Harry Potter and the Chamber of Secrets is 251 pages long. Without doing any calculations, compare the z -score of this book to the z -score of Harry Potter and the Prisoner of Azkaban. Explain your reasoning.
3. Gina is examining gas prices across the county. She randomly selects 10 gas stations, each from different states, and records the gas price. The average price per gallon of regular gas is \$3.31. The gas station located in California has a gas price of \$4.66 per gallon and a z -score of 2.04. Find the standard deviation of the gas prices for these 10 gas stations.

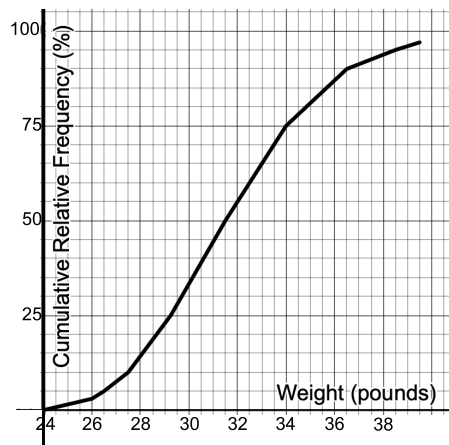
4. Values A and B are two different data values from the same distribution. Value A has a z -score of 1.4 and Value B has a z -score of -2.1 .
- Which value is farther from the mean? Explain.
 - Which value is at the larger percentile? Explain.
5. As part of a training program, inexperienced pilots take an online reaction speed test. The mean reaction time for the test is 273 milliseconds with a standard deviation of 82 milliseconds.
- Fiona Flyer's reaction time has a z -score of -0.9 . What was Fiona's reaction time?
 - Tommy Takeoff's reaction time was the same amount of time away from the mean reaction time as Fiona's, but his time was NOT the same as Fiona's. How is this possible?
 - What was Tommy's reaction time?

6. The table shows the starting salary per year (in thousands of dollars) rounded to the nearest thousand, for a random sample of graduates majoring in business and graduates majoring in communications at a state university.

Group name	n	Mean	SD	Min	Q_1	Med	Q_3	Max
Business	14	69.929	5.954	60	65	70	74	81
Communications	15	56.467	6.632	44	52	57	63	65

- a. Who has a higher starting salary, a business graduate with a z -score of -1.2 or a communications graduate with a z -score of 0.7 ? Explain.
- b. Lindsey is one of the business graduates who earned a starting salary of \$72,000. Luke is a communications graduate with a starting salary of \$65,000. Which of these two graduates has the higher starting salary relative to graduates in their respective majors? Explain.
- c. For which group of graduates, business or communications, would it be more surprising to receive a starting salary of \$60,000? Explain.

7. Well-child visits are routine appointments for growing children to have their development checked by their pediatrician. During these appointments the pediatrician will check the child's weight and will compare that weight to other children of the same sex and age. The chart shows the weights of three-year-old boys and the corresponding cumulative relative frequency (percentile) as reported by the Center for Disease Control.



- a. Approximately what is the percentile for a weight of 32 pounds?
- b. Approximately what is the lowest weight needed in order to be in the top 25% of weights for all three-year-old boys?
- c. If a pediatrician has 200 three-year-old boy patients, approximately how many will have a weight of less than or equal to 27.5 pounds.
8. Sarah uses an activity tracker which records the number of steps she takes daily. On Monday she walked 14,563 steps which is at the 65th percentile of the distribution of the number of steps she has taken on all other days. Which of the following is a correct interpretation of this situation.
- A) The number of steps Sarah took on Monday is less than or equal to 65% of the number of steps she has taken on all other days.
- B) Sarah takes at least 14,563 steps on 65% of all the other days.
- C) The number of steps Sarah took on Monday is 65% greater than the number of steps she has taken on all other days.
- D) The number of steps Sarah took on Monday is greater than or equal to 65% of the number of steps she has taken on all other days.

9. The shoe size of American males is normally distributed with a mean size 10 and standard deviation of size 1.5. The shoe size of American females is normally distributed with a mean size 8.5 and standard deviation of size 1.5. Jack is an American male with shoe size 9. He has the same standardized shoe size (z -score) as Emmaline, an American female. What is Emmaline's shoe size?
- A) 7.5
 - B) 8.5
 - C) 9
 - D) 9.5