Section 3.5a Worksheet – Applying the Normal Distribution

MDM4U
David Chen

1) Calculate a z-score for each x-value given $\mu = 6$ and $\sigma = 2$.

a) $x = 5.3$ **b)** $x = 7.2$ **c)** $x = 9.9$ **d)** $x = 0.8$

2) Using the z-score table (or your calculator), find the percentile that corresponds to each of the following z-scores.

a) $z = 2.33$ **b)** $z = -0.83$

3) Given a normally distributed data set whose mean is 50 and whose standard deviation is 10, what value of x would a z-score of 2.5 have?

4) Adrian's average bowling score is 174, and is normally distributed with a standard deviation of 35. In what percent of games does Adrian score more than 200 points?

5) The top 10% of bowlers in Adrian's league get to play in an all-star game. If the league average is 170, with a standard deviation of 11 points, and is normally distributed what average score does Adrian need to have to obtain a spot in the all-star game?

6) IQ score of people around the world are normally distributed, with a mean of 100 and a standard deviation of 15. A genius is someone with an IQ greater than or equal to 140. What percent of the population is considered genius?

7) A standardized test is known to be normally distributed with a mean of 500 and a standard deviation of 110.

a) A student's score is 675, what percentile is she in?
b) Another student taking the same test wants to score in the 80th percentile. What score must he get?

8) The weights of 75 model planes at a local convention are normally distributed. The average weight is 4.4 kg, with a standard deviation of 0.41 kg.

a) How many planes have a mass less than 4 kg?
b) How many planes would be disqualified if it were against the rules to have a plane with a mass of more than 5 kg?
c) How many planes have a mass between 3.5 kg and 5 kg?

9) On the driving range, Tiger Woods practices his swing with a particular club by hitting many, many balls. Suppose that wen Tiger hits his driver, the distance the ball travels follows a normal distribution with mean 304 yards and standard deviation 8 yards.

a) What percent of Tiger's drives travel at least 290 yards?
b) What percent of Tiger's drives travel between 305 and 325 yards?

10) For the distribution $X \sim N(3, 0.74^2)$ determine the percent of the data that is within the given interval

a) $X > 2.44$ **b)** $1.8 < X < 2.3$ **c)** $X < 1.91$

11) Perch in a lake have a mean length of 20 cm and a standard deviation of 5 cm. What would be the length of a fish in the 95th percentile?