

Section 3.5a Worksheet - Applying the Normal Distribution

MDM4U

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- 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 when 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?