

Math 3

Name _____

Normal Distributions

Date _____ Per _____

1. The batting average for major league baseball is an approximately normal distribution with a mean of 0.261 and a standard deviation of 0.034.
 - a. What percentage of batting averages are between 0.193 and 0.329?
 - b. What percentage of values are less than 0.227?
 - c. If a player hit 0.295 what is his percentile rank?

2. College GPA's are approximately normally distributed with a mean of 2.85 and a standard deviation of 0.2.
 - a. What would the GPA be for a student who is in the 16th percentile?
 - b. What GPA would a student have if they are in the top 2.5% of their class?
 - c. What percentage of students have a GPA above 3.05?

3. X is a normally distributed variable with a mean $\mu = 30$ and standard deviation $\sigma = 4$. Find the probability of each and include a sketch to represent your answer.
- $P(x < 40)$
 - $P(x > 21)$
 - $P(30 < x < 35)$
4. A radar unit is used to measure speeds of car on a motorway. The speeds are normally distributed with a mean of 90 km/hr and a standard deviation of 10 km/hr. What is the probability that a car picked at random is traveling at more than 100 km/hr?
5. Entry to a certain University is determined by a national test. The score on this test are normally distributed with a mean of 500 and a standard deviation of 100. Tom want to be admitted to this university and he knows that he must score better than at least 70% of the students who took the test. Tom takes the test and scores 585. Will he be admitted to this university?

6. The length of life of an instrument produced by a machine has a normal distribution with a mean of 12 months and a standard deviation of 2 months. Find the probability that an instrument produced by this machine will last
 - a. less than 7 months
 - b. Between 12 and 7 months

7. The length of similar components produced by a company are approximated by a normal distribution model with a mean of 5 cm and a standard deviation of 0.02 cm. If a component is chosen at random
 - a. What is the probability that the length of this component is between 4.98 and 5.02 cm?
 - b. What is the probability that the length of the component is between 4.96 and 5.04 cm?

8. The time taken to assemble a car in a certain plant is a random variable having a normal distribution of 20 hours and a standard deviation of 2 hours. What is the probability that a car can be assembled at this plant in a period of time
 - a. Less than 19.5 hours?
 - b. Between 20 and 22 hours?

9. A large group of students took a test in Physics and the final grades have a mean of 70 and a standard deviation of 10. If we can approximate the distribution of these grades by a normal distribution, what percent of the students

a. Scored higher than 80?

b. Should pass the test (grades ≥ 60)?

c. Should fail the test (grades < 60)?

10. The annual salaries of employees in a large company are approximately normally distributed with a mean of \$50,000 and a standard deviation of \$20,000.

a. What percent of people earn less than \$40,000?

b. What percent of people earn between \$45,000 and \$65,000?

c. What percent of people earn more than \$70,000?