

Name _____ Period _____

Spring Midterm Practice Test

Normal Population & Sampling Distributions

#1-2 Portlandia Television is a regional manufacturer of big screen televisions. The number of defective televisions produced in its Portland factory in any given week is normally distributed with a mean of 80 televisions, and a standard deviation of 15 televisions.

#1 Find the proportion of weeks where Portlandia produces more than **89** defective televisions in its Portland factory.

#2 The Chief Operating Officer (COO) will receive a bonus if the average weekly number of defective televisions is less than **78** for a 13-week period. The COO gets fired if the average weekly number of defective televisions exceeds **83** for a 13-week period. Find the probability that Portlandia's COO keeps his job but fails to earn the bonus.

#3-4 Glamour Tips is an on-line magazine available throughout the world. The number of "active users" per second can be approximated by a normal distribution with a mean of 14,000 and a standard deviation of 4,000.

#3 The site will freeze if the number of active users per second exceeds **19,000**. What proportion of the time is the site frozen?

#4 Glamour Tips can charge an advertising premium if the average number of active users exceeds **14,250** over a ten-minute period. If a ten-minute period is chosen at random, what is the probability that Glamour Tips earned a premium for that period?

#5-6 Timberlake Dance is a national dance troop. The percentage of unsold seats for their performances varies considerably for each performance, but it can be estimated using a normal distribution with a mean of 17.8% and a standard deviation of 5.7%. The troop performs one show per night, plus a matinee on Thursday, Saturday and Saturday.

#5 What is the probability that the percentage of empty seats is less than **15%** for a performance?

#6 The troop loses money if the average percentage of empty seats exceeds **17%** for any given week. What proportion of the weeks does Timberlake Dance lose money?

#7-8 Each day, Big Winner Casino's black jack tables earn an amount that is distributed normally with a standard deviation of \$26,000, and a mean of \$143,000.

#7 The pit boss becomes suspicious when a table earns less than **\$110,000**. What proportion of the time is the pit boss suspicious due to low table earnings?

#8 Every month where Big Winner earns an average of **\$138,000** or more, it makes a profit. Find the probability that Big Winner Casino makes a profit in any given month.