Mth 102 - General Education Statistics - Practice Exam 4

NOTE: This exam should not be taken as a complete list of possible problems. It is merely intended to be an example of the length and difficulty level of the regular exam. To best utilize it as a *practice* exam, give yourself 55 minutes with no distractions. Try to emulate the classroom environment as much as possible.

1. Suppose the random variable X is normally distributed with $\mu = 15$ and $\sigma = 3$. Indicate approximately where the individuals x = 12, 15, and 24 are on the normal curve shown below.



- 2. Find P(Z < 1.53).
- 3. Find P(Z > -1.2)
- 4. Find P(-1.35 < Z < 2.48).

5. Estimate P(Z < 4). Explain your reasoning.

6. Find $Z_{0.025}$.

7. Find a *Z* such that 92% of all values are less than *Z*.

8. Suppose the scores on an exam were normally distributed with an average of 75 and a standard deviation of 10. What percent of the class received an A? (An A is at least 90 points.)

9. What is the probability that a randomly selected individual did not pass the exam? (A student needs at least a 60 to pass the exam.)

10. What value was the 3rd quartile? (Hint: The 3rd quartile is the 75th percentile.)

11. In 2000, as reported by ACT Research Service, the mean ACT Math score was $\mu = 20.7$. If ACT math scores are normally distributed with $\sigma = 5$, what is the probability that a randomly selected ACT test taker has a math score of 18 or less?

12. The graph below is the normal probability plot for the three-year rate of return of 19 randomly selected small-capitalization growth mutual funds. Is there evidence to support the belief that the variable "three-year rate of return" is normally distributed? Justify your answer.



13. Explain in your own words the meaning of the phrase "sampling error".

14. Consider the case again of an exam with a mean of 75 and a standard deviation of 10. What is the probability that a randomly selected *sample* of size n = 25 will have a *mean* of 80 or more?

15. IQ scores are known to be normally distributed with a population mean of approximately 100 and a population standard deviation of about 16. Find the probability that a randomly selected sample of 20 individuals has a sample mean of at least 106.

16. Suppose the average GPA of ECC students is 2.7, with a standard deviation of 0.6. What is the probability that 100 randomly selected students will have a *sample mean* of less than 2.5?