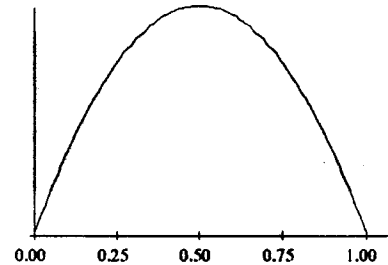


Directions: *Work on these sheets.*

Part 1: Multiple Choice. *Circle the letter corresponding to the best answer.*

1. For the density curve shown, which statement is true?
- (a) The density curve is symmetric.
 - (b) The density curve is skewed right.
 - (c) The density curve is skewed left.
 - (d) The density curve is normal.
 - (e) None of the above is correct.

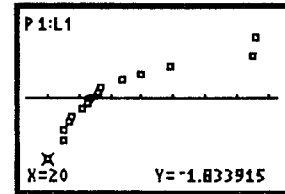


2. For the density curve shown in Question 1, which statement is true?
- (a) The mean and median are equal.
 - (b) The mean is greater than the median.
 - (c) The mean is less than the median.
 - (d) The mean could be either greater than or less than the median.
 - (e) None of the above is correct.
3. Suppose that sixteen-ounce bags of chocolate chip cookies are produced with an actual mean weight of 16.1 ounces and a standard deviation of 0.1 ounce. The percentage of bags that will contain between 16.0 and 16.1 ounces is
- (a) 10
 - (b) 16
 - (c) 34
 - (d) 68
 - (e) none of the above
4. This is a continuation of Question 3. Approximately what percentage of the bags will likely be underweight (i.e., less than 16 ounces)?
- (a) 10
 - (b) 16
 - (c) 32
 - (d) 64
 - (e) none of the above
5. Which statement is true for any density curve?
- (a) The bars must be of equal width.
 - (b) It is symmetric.
 - (c) It must either steadily rise or steadily fall, since it cannot do both.
 - (d) One can use Table A (table of standard normal values) to find relative frequencies.
 - (e) None of the above is correct.

6. Increasing the frequencies in the tails of a distribution will:
- Not affect the standard deviation as long as the increases are balanced on each side of the mean
 - Not affect the standard deviation
 - Increase the standard deviation
 - Reduce the standard deviation
 - None of the above

7. The plot shown is a normal probability plot for a set of data. The data value is plotted on the x -axis, and the standardized value is plotted on the y -axis. Which statement is true for this data set?

- The data are clearly normally distributed.
- The data are approximately normally distributed.
- The data are clearly skewed to the right.
- The data are clearly skewed to the left.
- There is insufficient information to determine the shape of the distribution.



8. Which of the following are true statements?

- The area under a normal curve is always 1, regardless of the mean and standard deviation.
 - The mean is always equal to the median for any normal distribution.
 - The interquartile range for any normal curve extends from $\mu - 1\sigma$ to $\mu + 1\sigma$.
- I and II
 - I and III
 - II and III
 - I, II, and III
 - None of the above gives the correct set of true responses.

9. Pop1 and Pop2 are normal density curves with means and standard deviations μ_1, σ_1 and μ_2, σ_2 , respectively. Suppose that $\mu_1 = \mu_2$ and $\sigma_1 = 2(\sigma_2)$. Consider these statements:

- Pop1 has twice as many observations within one standard deviation of the mean as Pop2.
 - The density curve for Pop1 is taller than that of Pop2.
 - The density curves are centered around different numbers.
- Which of these statements are correct?

- I only
- II only
- III only
- I and II only
- None of the above gives the correct set of true responses.

Part 2: Free Response

Answer completely, but be concise. Write sequentially and show all steps.

10. Scores on the Wechsler Adult Intelligence Scale (a standard IQ test) are approximately normally distributed within age groups. For the 20–34 age group, the mean is 110 and the standard deviation is 25. For the 60–64 age groups, the mean is 90 and the standard deviation is 25. Sarah is 29 and her mother is 62. Sarah scores 135 on the Wechsler test, while Ann scores 120. Who has the better score, relative to her age group?

11. In a normally distributed population, what percent of the population observations lie within 2.576 standard deviations of the mean? Include a sketch to illustrate your answer.

12. Use Table A to find the proportions of observations from a standard normal distribution that satisfies each of these statements. In both cases, sketch a standard normal curve and shade the area under the curve that answers the question.

(a) $Z > -1.68$

(b) $-0.84 < Z < 1.26$

13. The length of time needed to complete a certain test is normally distributed with mean 60 minutes and standard deviation 10 minutes.

(a) What is the relative frequency of people who take between 45 and 65 minutes to complete the test? Sketch a standard normal curve and shade the area in question.

(b) Find an interval that contains the middle 95% of completion times for all people taking the test. Sketch required.

14. The Graduate Record Examinations are widely used to help predict the performance of applicants to graduate schools. The range of possible scores on a GRE is 200 to 900. The psychology department finds that the scores of its applicants on the quantitative GRE are approximately normal with mean 544 and standard deviation 103. What minimum score would a student need in order to score in the top 10% of those taking the test?

Ch 2 Review

(1) a (2) a (3) c (4) b (5) e (6) c (7) c (8) a (9) e (10) Sarah: $Z = 1$; Ann: $Z = 1.2$. Ann scored better. (11) 99% (12a) Rel. Freq. = 0.9535 (12b) Rel. Freq. = 0.6957. (13a) $45 < X < 65$ corresponds to $-1.5 < Z < 0.5$. Rel. Freq. = 0.6247. (13b) Using the 68-95-99.7 rule, the approximate interval is $(\mu - 2\sigma, \mu + 2\sigma) = (40, 80)$. The actual interval is 60 ± 19.6 . (14) The minimum Z score is 1.28 which corresponds to a raw score of 675.84. Since GRE scores are whole numbers, the score must be at least 676.
