

32. The heights of American men aged 18 to 24 are approximately normal with a mean of 68 inches and a standard deviation of 2.5 inches. About 20% of these men are taller than
- (A) 66 inches
 - (B) 68 inches
 - (C) 70 inches
 - (D) 72 inches
 - (E) 74 inches

34. Polly takes three standardized tests. She scores 600 on all three. Using standard scores, or z-scores, rank her performance on the three tests from best to worst if the means and standard deviations for the tests are as follows:

| | Mean | Standard Deviation |
|-----------------|------|--------------------|
| Test I | 500 | 80 |
| Test II | 470 | 120 |
| Test III | 560 | 30 |

- (A) I, II, and III
 - (B) III, II, and I
 - (C) I, III, and II
 - (D) III, I, and II
 - (E) II, I, and III
24. A researcher interested in the age at which women are having their first child surveyed a simple random sample of 250 women having at least one child and found a approximately normal distribution with a mean age of 27.3 and a standard deviation of 5.4. According to the empirical rule, also known as the 68-95-99.7 rule, approximately 95% of the women had their first child between the ages of
- (A) 11.1 years and 43.5 years
 - (B) 16.5 years and 38.1 years
 - (C) 21.9 years and 32.7 years
 - (D) 21.9 years and 38.1 years
 - (E) 25.0 years and 29.6 years

8. Maritsa scored 82 on a geometry exam for which the class mean was 74 and the standard deviation 3.2 and she scored 86 on a biology exam for which the class mean was 77 with a standard deviation of 2.9. In comparison to other members of each of these classes, which of the following conclusions can you draw?
- (A) Her performance on the geometry exam was better than her performance on the biology exam.
 - (B) Her performance on the biology exam was better than her performance on the geometry exam.
 - (C) Her relative performance was the same for both exams.
 - (D) Her relative performance was graded unfairly.
 - (E) No conclusion can be drawn from this data.
19. The admissions policy at a certain university requires that incoming students score in the upper 20% on a standardized test. If the mean score on the test is 510 and the standard deviation of the scores is 80, what is the minimum score that a student can earn on the test to meet the admissions requirement? Scores on the test are normally distributed and are reported in intervals of 10.
- (A) 520
 - (B) 580
 - (C) 590
 - (D) 600
 - (E) 620
24. Which of the following statements is true concerning a normal distribution curve?
- I. The curve is symmetric about its mean.
 - II. The curve is always symmetric about 0.
 - III. The area under the curve lying within one standard deviation of the mean contains approximately 50% of the scores.
- (A) I only
 - (B) II only
 - (C) III only
 - (D) I and III only
 - (E) I, II, and III
38. Which statement(s) below concerning two normal distribution curves are necessarily true?
- I. Two normal curves can have the same mean, but different standard deviations.
 - II. Two normal curves can have the same standard deviation, but different means.
 - III. For two normal curves, the curve with the larger mean must also have the larger standard deviation.
- (A) I only
 - (B) II only
 - (C) III only
 - (D) I and II only
 - (E) I, II, and III

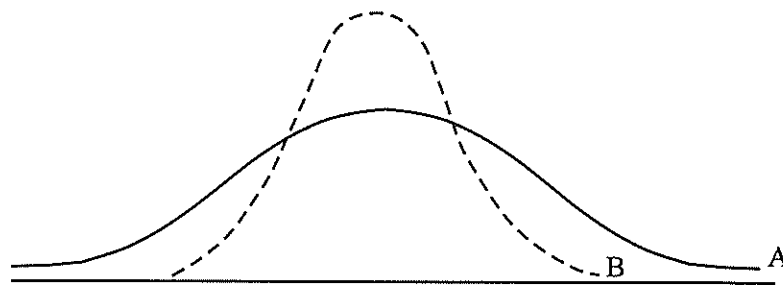
4. The scores on the real estate licensing examination given in a particular state are normally distributed with a standard deviation of 70. What is the mean test score if 25% of the applicants score above 475?

- (A) 416
- (B) 428
- (C) 468
- (D) 522
- (E) There is not enough information to answer this question

18. A distribution that is symmetric and mound-shaped has a mean of 30 and a standard deviation of 2. According to the Empirical Rule, approximately 68% of the data lie between

- (A) 24 and 36
- (B) 26 and 34
- (C) 28 and 32
- (D) 20 and 40
- (E) 25 and 35

19. The figure below shows the probability density functions of two symmetric distributions with the same mean.



Which of the following statements are true?

- (A) median A > median B; $\sigma_A = \sigma_B$
- (B) median A < median B; $\sigma_A > \sigma_B$
- (C) median A = median B; $\sigma_A > \sigma_B$
- (D) median A = median B; $\sigma_A < \sigma_B$
- (E) It cannot be determined from the information given.

21. A survey was taken to determine the number of hours per week students studied mathematics. The distribution was approximately normal with a mean of 20 hours and a standard deviation of four hours. Approximately what percent of the students studied between 27 and 30 hours?

- (A) 0.00338%
- (B) 0.004594
- (C) 0.4937%
- (D) 3.39%
- (E) 4.937%

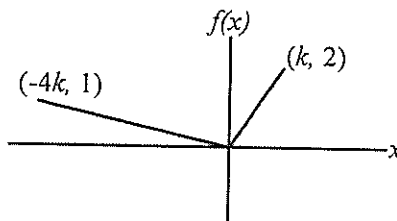
26. A normal distribution

- (A) is sometimes symmetrical
- (B) is sometimes skewed
- (C) always has a mean of zero
- (D) is a distribution of a continuous random variable
- (E) always has a variance of one

1. An SRS of 100 firemen found that the average time they worked as firemen was $\bar{x} = 20$ years with standard deviation $s = 5$ years. Assume that the distribution of the time firemen worked for the department is approximately normal. According to the 68-95-99.7 rule, approximately 68% of the fireman worked

- (A) between 5 and 15 years
- (B) between 10 and 30 years
- (C) between 15 and 25 years
- (D) between 17 and 23 years
- (E) 25 years

3. A continuous random variable x has a probability density function $f(x)$ as shown below.



The value of k is:

- (A) 0
- (B) $1/6$
- (C) $1/3$
- (D) $1/2$
- (E) 2

7. Grades on a statistics test are normally distributed with a mean of 76 and a standard deviation of 8. Our teacher will give the top 10% an A, the next 20% a B, the next 40% a C, the next 20% a D, and the bottom 10% an F. The students who received F's in the course had no higher than

- (A) 65.75
- (B) 69.24
- (C) 71.84
- (D) 80.14
- (E) 86.4

8. The mean score on a nationally used standardized reading exam was 75 with a standard deviation of four. What would be the z-score for a child who scored an 81?
- (A) -1.5
 - (B) -1.03
 - (C) 1.03
 - (D) 1.05
 - (E) 1.5
37. Howard needs to have a tree cut down in his backyard. A tree service gives him an estimate of \$6500. Howard feels this is too high and calls the Better Business Bureau which reports the average cost for that service in his area is \$4200 with a standard deviation of \$750. Assuming that the costs are normally distributed, Howard concludes that approximately 95% of the time, the cost should roughly fall between which two values?
- (A) (1950, 6450)
 - (B) (2700, 5700)
 - (C) (3450, 4950)
 - (D) (5000, 8000)
 - (E) (5750, 7250)
6. The verbal scores of incoming freshmen at a large university are approximately normally distributed with a mean of 550 and a standard deviation of 100. The administration wishes to give an honors English course to the top 5% of the freshmen. What is the minimum score that must be attained to qualify for the course?
- (A) 550
 - (B) 600
 - (C) 665
 - (D) 715
 - (E) 745
15. Evan and Amy are two seniors in a local high school. The grades on a Calculus final which Evan took were approximately normally distributed with a mean of 75 and a standard deviation of 7. The grades on a Psychology final which Amy took were also approximately normally distributed with a mean of 85 and a standard deviation of 4. Evan scored an 89 on the Calculus final while Amy scored a 91 on the Psychology final. Relative to the students in each class, who did better on the final?
- (A) Evan
 - (B) Amy
 - (C) Both were the same
 - (D) You cannot compare a math course to a science course
 - (E) There is not enough information to answer this question

16. The distribution of lengths of boa constrictors is approximately normally distributed. If 11.5% of these snakes are more than 147 inches long and 2.3% are less than 139 inches long, what are the mean and variance of the lengths of boa constrictors?

- (A) $\mu = 142, \sigma^2 = 4.12$
- (B) $\mu = 143, \sigma^2 = 2.5$
- (C) $\mu = 143, \sigma^2 = 6.25$
- (D) $\mu = 144, \sigma^2 = 2.5$
- (E) $\mu = 144, \sigma^2 = 6.25$

20. George Washington High School has a distribution of grade point averages which are approximately normally distributed with a mean of 2.5 and a standard deviation of 0.5. All students with a 3.5 or higher grade point average graduate with honors. According to the Empirical Rule, approximately what percentage of the students will graduate with honors?

- (A) 2.5%
- (B) 5%
- (C) 13.5%
- (D) 16%
- (E) 95%

22. The mean of a set of data is 40 pounds and the standard deviation is 8 pounds. What value of an observation corresponds to a z -score of -1.25 ?

- (A) -30
- (B) -50
- (C) 30
- (D) 32
- (E) 50

Answers: 32-c 34-d 24-b 8-b 19-b 24-a 38-d 4-b 18-c 19-c 21-d
26-d 1-c 3-c 7-a 8-e 37-b 6-d 15-a 16-e 20-a 22-c