

Name _____

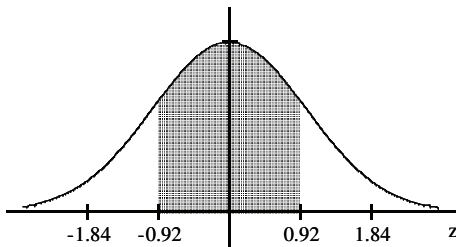
MULTIPLE CHOICE

Use a table of areas to find the specified area under the standard normal curve.

- 1) The area that lies between 0 and 3.01 1) _____
 A) 0.4987 B) 0.5013 C) 0.1217 D) 0.9987
- 2) The area that lies to the left of 1.13 2) _____
 A) 0.8708 B) 0.8907 C) 0.8485 D) 0.1292
- 3) The area that lies to the right of -1.82 3) _____
 A) 0.4656 B) -0.0344 C) 0.9656 D) 0.0344

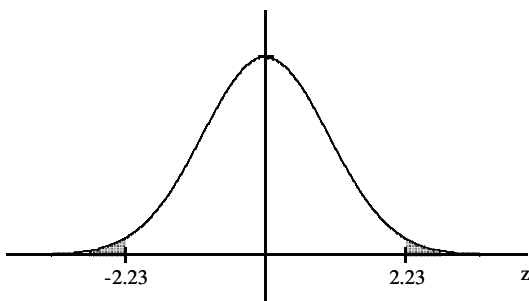
Use a table of areas to obtain the shaded area under the standard normal curve.

- 4) 4) _____



- A) 0.1788 B) 0.8212 C) 0.3576 D) 0.6424

- 5) 5) _____



- A) 0.9871 B) 0.0129 C) 0.0258 D) 0.9742

Find the indicated probability or percentage for the normally distributed variable.

- 6) The variable X is normally distributed. The mean is $\mu = 60.0$ and the standard deviation is $\sigma = 4.0$. Find $P(X < 53.0)$. 6) _____
 A) 0.5589 B) 0.0401 C) 0.0802 D) 0.9599
- 7) The diameters of bolts produced by a certain machine are normally distributed with a mean of 0.30 inches and a standard deviation of 0.01 inches. What percentage of bolts will have a diameter greater than 0.32 inches? 7) _____
 A) 2.28% B) 97.72% C) 37.45% D) 47.72%

- 8) The volumes of soda in quart soda bottles are normally distributed with a mean of 32.3 oz and a standard deviation of 1.2 oz. What is the probability that the volume of soda in a randomly selected bottle will be less than 32 oz? 8) _____
 A) 0.5987 B) 0.0987 C) 0.3821 D) 0.4013
- 9) The lengths of human pregnancies are normally distributed with a mean of 268 days and a standard deviation of 15 days. What is the probability that a pregnancy lasts at least 300 days? 9) _____
 A) 0.4834 B) 0.0166 C) 0.9834 D) 0.0179

Use the empirical rule to solve the problem.

- 10) The lifetimes of lightbulbs of a particular type are normally distributed with a mean of 210 hours and a standard deviation of 5 hours. What percentage of the bulbs have lifetimes that lie within 1 standard deviation to either side of the mean? 10) _____
 A) 95.44% B) 68.26% C) 31.74% D) 84.13%
- 11) The lifetimes of lightbulbs of a particular type are normally distributed with a mean of 400 hours and a standard deviation of 12 hours. What percentage of the bulbs have lifetimes that lie within 2 standard deviations to either side of the mean? 11) _____
 A) 97.72% B) 99.74% C) 95.44% D) 68.26%
- 12) The amount of Jen's monthly phone bill is normally distributed with a mean of \$73 and a standard deviation of \$9. What percentage of her phone bills are between \$46 and \$100? 12) _____
 A) 99.99% B) 95.44% C) 99.74% D) 68.26%

Provide an appropriate response.

- 13) True or false, the mean of a normally distributed variable can be any real number. 13) _____
 A) True B) False
- 14) True or false, the standard deviation of a normally distributed variable can be any real number. 14) _____
 A) True B) False
- 15) True or false, areas under the standard normal curve cannot be negative, whereas z-scores can be positive or negative. 15) _____
 A) True B) False

Estimate the indicated probability by using the normal distribution as an approximation to the binomial distribution.

- 16) Two percent of hair dryers produced at a certain plant are defective. Estimate the probability that of 10,000 randomly selected hair dryers, the number of defectives is between 195 and 210 inclusive. 16) _____
 A) 0.4251 B) 0.3989 C) 0.4017 D) 0.4034

For samples of the specified size from the population described, find the mean and standard deviation of the sample mean \bar{x} .

- 17) The National Weather Service keeps records of rainfall in valleys. Records indicate that in a certain valley, the annual rainfall has a mean of 95 inches and a standard deviation of 12 inches. Suppose the rainfalls are sampled during randomly picked years and \bar{x} is the mean amount of rain in these years. For samples of size 36, determine the mean and standard deviation of \bar{x} . 17) _____
 A) $\mu_{\bar{x}} = 12; \sigma_{\bar{x}} = 95$ B) $\mu_{\bar{x}} = 2; \sigma_{\bar{x}} = 95$
 C) $\mu_{\bar{x}} = 95; \sigma_{\bar{x}} = 2$ D) $\mu_{\bar{x}} = 95; \sigma_{\bar{x}} = 12$

Provide an appropriate response.

- 18) The mean height for a population is 65 inches and the standard deviation is 3 inches. Let \bar{x} denote the mean height for a sample of people picked randomly from the population. True or false, the standard deviation of \bar{x} for samples of size 30 is greater than the standard deviation of \bar{x} for samples of size 20? 18) _____
A) True B) False

- 19) The mean height for a population is 65 inches. Let \bar{x} denote the mean height for a sample of people picked randomly from the population. True or false, the standard deviation of \bar{x} for samples of size 30 is smaller than the standard deviation, σ , of the population? 19) _____
A) True B) False

Identify the distribution of the sample mean. In particular, state whether the distribution of \bar{x} is normal or approximately normal and give its mean and standard deviation.

- 20) The weights of people in a certain population are normally distributed with a mean of 152 lb and a standard deviation of 22 lb. Determine the sampling distribution of the mean for samples of size 2. 20) _____
A) Approximately normal, mean = 152 lb, standard deviation = 15.56 lb
B) Approximately normal, mean = 152 lb, standard deviation = 11 lb
C) Normal, mean = 152 lb, standard deviation = 22 lb
D) Normal, mean = 152 lb, standard deviation = 15.56 lb

- 21) The mean annual income for adult women in one city is \$28,520 and the standard deviation of the incomes is \$5700. The distribution of incomes is skewed to the right. Determine the sampling distribution of the mean for samples of size 132. 21) _____
A) Approximately normal, mean = \$28,520, standard deviation = \$496
B) Normal, mean = \$28,520, standard deviation = \$43
C) Approximately normal, mean = \$28,520, standard deviation = \$5700
D) Normal, mean = \$28,520, standard deviation = \$496

- 22) The lengths of pregnancies are normally distributed with a mean of 273 days and a standard deviation of 20 days. If 64 women are randomly selected, find the probability that they have a mean pregnancy between 273 days and 275 days. 22) _____
A) 0.2881 B) 0.2119 C) 0.7881 D) 0.5517

- 23) Assume that the heights of women are normally distributed with a mean of 63.6 inches and a standard deviation of 2.5 inches. If 100 women are randomly selected, find the probability that they have a mean height greater than 63.0 inches. 23) _____
A) 0.0082 B) 0.2881 C) 0.9918 D) 0.8989

- 24) The body temperatures of adults are normally distributed with a mean of 98.6° F and a standard deviation of 0.60° F. If 36 adults are randomly selected, find the probability that their mean body temperature is greater than 98.4° F. 24) _____
A) 0.9360 B) 0.8188 C) 0.9772 D) 0.0228

Use the Central Limit Theorem to find the mean and standard error of the mean of the indicated sampling distribution.

- 25) The amounts of time employees of a telecommunications company have worked for the company are normally distributed with a mean of 5.1 years and a standard deviation of 2.0 years. Random samples of size 18 are drawn from the population and the mean of each sample is determined. 25) _____
A) 5.1 years, 0.47 years B) 1.2 years, 2.0 years
C) 1.2 years, 0.47 years D) 5.1 years, 0.11 years