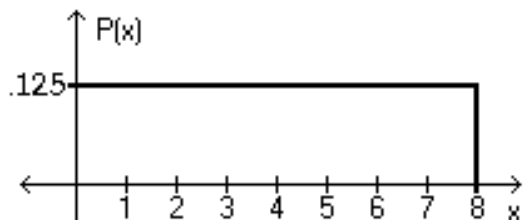MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Using the following uniform density curve, answer the question.


1) What is the probability that the random variable has a value greater than 4?   1) _____
   A) 0.450   B) 0.625   C) 0.375   D) 0.500

Assume that the weight loss for the first month of a diet program varies between 6 pounds and 12 pounds, and is spread evenly over the range of possibilities, so that there is a uniform distribution. Find the probability of the given range of pounds lost.

2) Between 8 pounds and 11 pounds   2) _____

   A) $\dfrac{1}{3}$ B) $\dfrac{2}{3}$ C) $\dfrac{1}{2}$ D) $\dfrac{1}{4}$
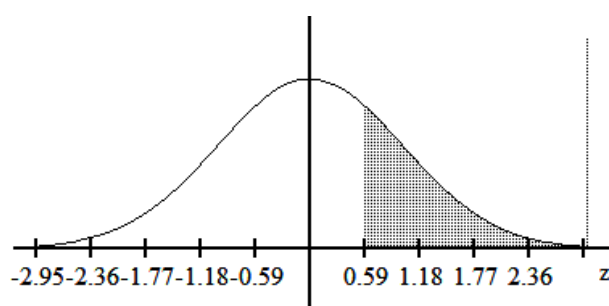
Find the area of the shaded region. The graph depicts the standard normal distribution with mean 0 and standard deviation 1.

3)   3) _____
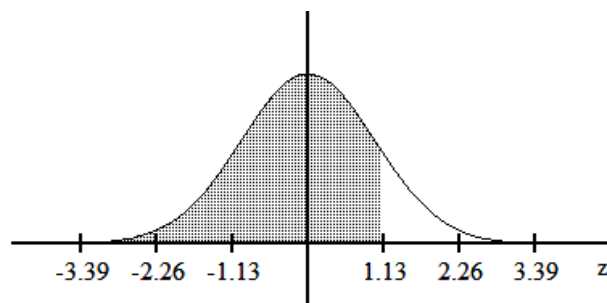
   A) 0.1292   B) 0.8485   C) 0.8708   D) 0.8907

4)   4) _____
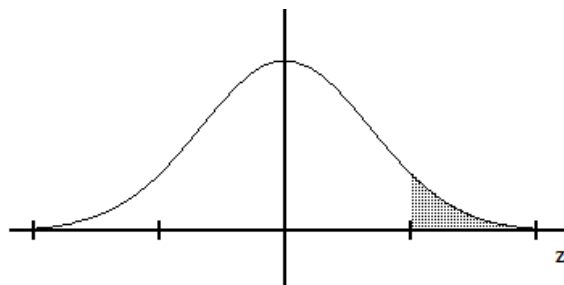

   A) 0.7224   B) 0.2776   C) 0.2190   D) 0.2224

Find the indicated z score. The graph depicts the standard normal distribution with mean 0 and standard deviation 1.

5) Shaded area is 0.0694.   5) _____

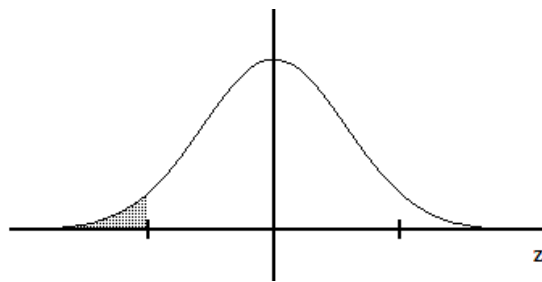   A) 1.39   B) 1.45   C) 1.26   D) 1.48

6) Shaded area is 0.0401.   6) _____

    A) -1.89   B) -1.48   C) -1.75   D) -1.63

If z is a standard normal variable, find the probability.

7) The probability that z lies between -2.41 and 0   7) _____
    A) 0.0948   B) 0.4920   C) 0.5080   D) 0.4910

8) The probability that z lies between 0 and 3.01   8) _____
    A) 0.1217   B) 0.5013   C) 0.9987   D) 0.4987

9) P(-0.73 < z < 2.27)   9) _____
    A) 1.54   B) 0.2211   C) 0.4884   D) 0.7557

The Precision Scientific Instrument Company manufactures thermometers that are supposed to give readings of 0°C at the freezing point of water. Tests on a large sample of these thermometers reveal that at the freezing point of water, some give readings below 0°C (denoted by negative numbers) and some give readings above 0°C (denoted by positive numbers). Assume that the mean reading is 0°C and the standard deviation of the readings is 1.00°C. Also assume that the frequency distribution of errors closely resembles the normal distribution. A thermometer is randomly selected and tested. Find the temperature reading corresponding to the given information.

10) Find Q_3, the third quartile.   10) _____
    A) 0.67°   B) 0.82°   C) -1.3°   D) 0.53°

11) If 7% of the thermometers are rejected because they have readings that are too high, but all   11) _____
    other thermometers are acceptable, find the temperature that separates the rejected
    thermometers from the others.
    A) 1.45°   B) 1.39°   C) 1.48°   D) 1.26°

Find the indicated value.

12) $z_{0.36}$ 12) _____
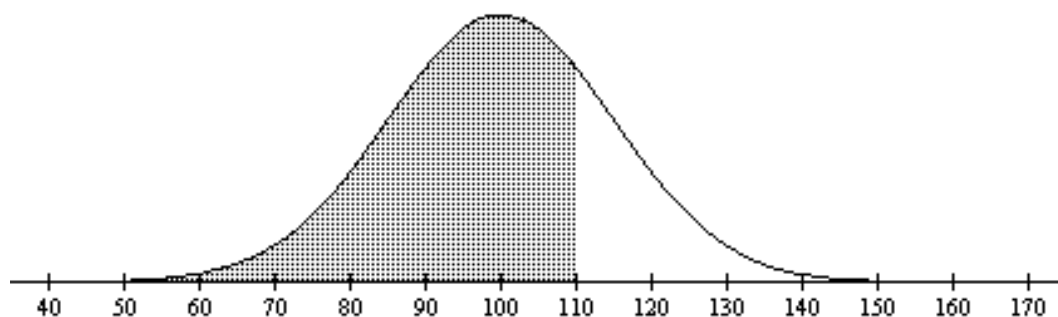   A) 1.60   B) 0.36   C) 0.45   D) 1.76

Provide an appropriate response.

13) Find the area of the shaded region. The graph depicts IQ scores of adults, and those scores are normally distributed with a mean of 100 and a standard deviation of 15 (as on the Wechsler test).

13) _____

A) 0.6293 B) 0.7486 C) 0.4400 D) 0.8051

14) Find the area of the shaded region. The graph depicts IQ scores of adults, and those scores are normally distributed with a mean of 100 and a standard deviation of 15 (as on the Wechsler test).
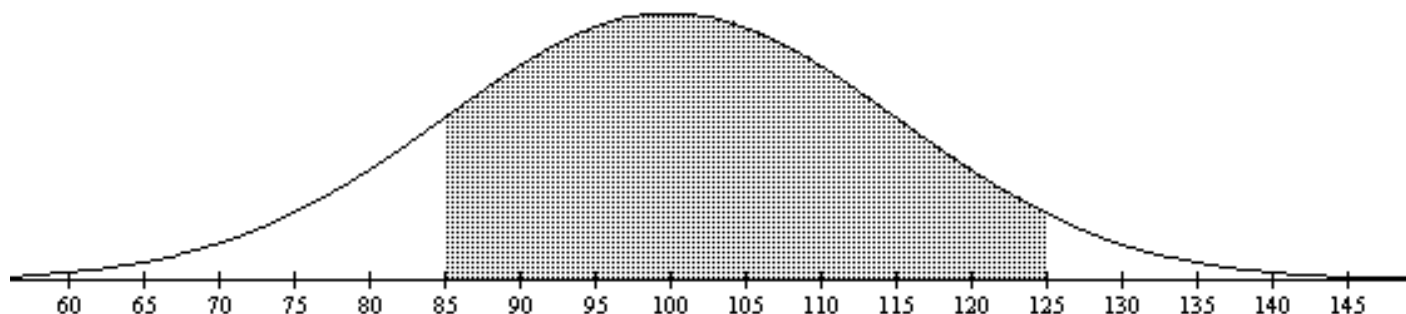
14) _____

A) 0.7745 B) 0.7619 C) 0.7938 D) 0.7303

15) Find P_{40}, which is the IQ score separating the bottom 40% from the top 60%.

15) _____

A) 96.6 B) 95.6 C) 96.1 D) 95.2

Solve the problem. Round to the nearest tenth unless indicated otherwise.

16) Suppose that replacement times for washing machines are normally distributed with a mean of 9.4 years and a standard deviation of 2 years. Find the replacement time that separates the top 18% from the bottom 82%.

16) _____

A) 11.2 years B) 7.6 years C) 9.8 years D) 10.6 years

17) The weights of certain machine components are normally distributed with a mean of 8.2 g and a standard deviation of 0.1 g. Find the two weights that separate the top 3% and the bottom 3%. These weights could serve as limits used to identify which components should be rejected. Round to the nearest hundredth of a gram.

17) _____

A) 8.01 g and 8.39 g B) 7.98 g and 8.47 g
C) 8.18 g and 8.22 g D) 8.15 g and 8.25 g

Find the indicated probability.

18) 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?

18) _____

A) 97.72% B) 2.28% C) 37.45% D) 47.72%

19) The diameters of pencils produced by a certain machine are normally distributed with a mean of 0.30 inches and a standard deviation of 0.01 inches. What is the probability that the diameter of a randomly selected pencil will be less than 0.285 inches?

19) _____

    A) 0.4332   B) 0.0668   C) 0.9332   D) 0.0596

20) A bank's loan officer rates applicants for credit. The ratings are normally distributed with a mean of 200 and a standard deviation of 50. If an applicant is randomly selected, find the probability of a rating that is between 170 and 220.

20) _____

    A) 0.3811   B) 0.2257   C) 0.1554   D) 0.0703

21) 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?

21) _____

    A) 0.0179   B) 0.0166   C) 0.4834   D) 0.9834

Solve the problem.

22) Scores on a test have a mean of 73 and Q_3 is 81. The scores have a distribution that is approximately normal. Find P_{90}. (You will need to first find the standard deviation.)

22) _____

    A) 87.1   B) 88.8   C) 87.6   D) 88.3

23) The scores on a certain test are normally distributed with a mean score of 60 and a standard deviation of 2. What is the probability that a sample of 90 students will have a mean score of at least 60.2108?

23) _____

    A) 0.1587   B) 0.8413   C) 0.3413   D) 0.3174

24) For women aged 18-24, systolic blood pressures (in mm Hg) are normally distributed with a mean of 114.8 and a standard deviation of 13.1. If 23 women aged 18-24 are randomly selected, find the probability that their mean systolic blood pressure is between 119 and 122.

24) _____

    A) 0.0577   B) 0.0833   C) 0.9341   D) 0.3343

25) Human body temperatures are normally distributed with a mean of 98.20°F and a standard deviation of 0.62°F. If 19 people are randomly selected, find the probability that their mean body temperature will be less than 98.50°F.

25) _____

    A) 0.9826   B) 0.4826   C) 0.3343   D) 0.0833

26) Suppose that replacement times for washing machines are normally distributed with a mean of 9.3 years and a standard deviation of 1.1 years. Find the probability that 70 randomly selected washing machines will have a mean replacement time less than 9.1 years.

26) _____

    A) 0.4286   B) 0.0714   C) 0.0643   D) 0.4357

27) A study of the amount of time it takes a mechanic to rebuild the transmission for a 2005 Chevrolet Cavalier shows that the mean is 8.4 hours and the standard deviation is 1.8 hours. If 40 mechanics are randomly selected, find the probability that their mean rebuild time exceeds 8.7 hours.

27) _____

    A) 0.1346   B) 0.1469   C) 0.1946   D) 0.1285

28) A final exam in Math 160 has a mean of 73 with standard deviation 7.8. If 24 students are randomly selected, find the probability that the mean of their test scores is greater than 78.

28) _____

    A) 0.0103   B) 0.0036   C) 0.0008   D) 0.8962