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.

1) Between 8 pounds and 11 pounds 1) _____

2) More than 10 pounds 2) _____

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

3) The probability that Z is less than 1.13 3) _____

4) The probability that Z lies between -1.10 and -0.36 4) _____

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.

5) Find Q_3, the third quartile. 5) _____

6) A quality control analyst wants to examine thermometers that give readings in the bottom 4%. Find the reading that separates the bottom 4% from the others. 6) _____

Assume that X has a normal distribution, and find the indicated probability.

7) The mean is $\mu = 15.2$ and the standard deviation is $\sigma = 0.9$. Find the probability that X is greater than 15.2. 7) _____

8) The mean is $\mu = 137.0$ and the standard deviation is $\sigma = 5.3$. Find the probability that X is between 134.4 and 140.1. 8) _____

Find the indicated probability.

9) The weekly salaries of teachers in one state are normally distributed with a mean of $490 and a standard deviation of $45. What is the probability that a randomly selected teacher earns more than $525 a week? 9) _____

Solve the problem.

10) 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. Find P_{60}, the score which separates the lower 60% from the top 40%. 10) _____

11) The weights of the fish in a certain lake are normally distributed with a mean of 15 lb and a standard deviation of 6. If 4 fish are randomly selected, what is the probability that the mean weight will be between 12.6 and 18.6 lb? 11) _____

12) 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 less than 70. 12) _____

13) Find the critical value $z_{\alpha/2}$ that corresponds to a degree of confidence of 98%. 13) _____

Express the confidence interval in the form of $\hat{p} \pm E$.

14) $0.137 < p < 1.257$ 14) _____

Find the margin of error for the 95% confidence interval used to estimate the population proportion.

15) In a clinical test with 2440 subjects, 70% showed improvement from the treatment. 15) _____

Use the given degree of confidence and sample data to construct a confidence interval for the population proportion p.

16) $n = 158$, $x = 108$; 95 percent 16) _____

Find the minimum sample size you should use to assure that your estimate of $\hat{p}$ will be within the required margin of error around the population p.

17) Margin of error: 0.07; confidence level: 97%; $\hat{p}$ and $\hat{q}$ unknown 17) _____

18) Margin of error: 0.07; confidence level: 95%; from a prior study, $\hat{p}$ is estimated by the decimal equivalent of 92%. 18) _____

Solve the problem.

19) Find the point estimate of the true proportion of people who wear hearing aids if, in a random sample of 650 people, 76 people had hearing aids. 19) _____

Use the given degree of confidence and sample data to construct a confidence interval for the population proportion p.

20) A survey of 865 voters in one state reveals that 408 favor approval of an issue before the legislature. Construct the 95% confidence interval for the true proportion of all voters in the state who favor approval. 20) _____

Use the confidence level and sample data to find a confidence interval for estimating the population μ.

21) A random sample of 94 light bulbs had a mean life of $\bar{x} = 587$ hours with a standard deviation of $\sigma = 36$ hours. Construct a 90 percent confidence interval for the mean life, μ, of all light bulbs of this type. 21) _____

Use the margin of error, confidence level, and standard deviation σ to find the minimum sample size required to estimate an unknown population mean μ.

22) Margin of error: \$136, confidence level: 99%, $\sigma = \$503$ 22) _____

Do one of the following, as appropriate: (a) Find the critical value $z_{\alpha/2}$, (b) find the critical value $t_{\alpha/2}$, (c) state that neither the normal nor the t distribution applies.

23) 90%; $n = 10$; σ is unknown; population appears to be normally distributed. 23) _____

24) 91%; $n = 45$; σ is known; population appears to be very skewed. 24) _____

25) 95%; $n = 11$; σ is known; population appears to be very skewed. 25) _____

Find the margin of error.

26) 95% confidence interval; $n = 21$; $\bar{x} = 0.67$; $s = 0.67$ 26) _____

Use the given degree of confidence and sample data to construct a confidence interval for the population mean μ. Assume that the population has a normal distribution.

27) A savings and loan association needs information concerning the checking account balances of its local customers. A random sample of 14 accounts was checked and yielded a mean balance of \$664.14 and a standard deviation of \$297.29. Find a 98% confidence interval for the true mean checking account balance for local customers. 27) _____

28) A laboratory tested twelve chicken eggs and found that the mean amount of cholesterol was ~~244~~ 244.0 milligrams with $s = 14.9$ milligrams. Construct a 95 percent confidence interval for the true mean cholesterol content of all such eggs. 28) _____

Use the confidence level and sample data to find the margin of error E.

29) College students' annual earnings: 99% confidence; $n = 66$, $\bar{x} = \$3903$, $\sigma = \$801$ 29) _____

1) $\frac{1}{2}$

2) $\frac{1}{3}$

3) 0.8708
4) 0.2237
5) 0.67°
6) −1.75°
7) 0.5000
8) 0.4069
9) 0.2177
10) 212.5
11) 0.6730
12) 0.0301
13) 2.33
14) $\hat{p} = 0.697 \pm 0.56$
15) [illegible] .0182
16) $0.61 < p < 0.756$
17) 241
18) 58
19) 0.117
20) $0.438 < p < 0.505$
21) $581 < \mu < 593$
22) 91
23) $t_{\alpha/2} = 1.833$
24) $z_{\alpha/2} = 1.70$
25) Neither the normal nor the t distribution applies.
26) [illegible] 0.305
27) $\$453.59 < \mu < \$874.69$
28) $234.5 < \mu < 253.5$
29) $254