# 14.4 The Normal Distribution
## M. Goodroe - Quantitative Skills and Reasoning

## *Key Terms:*
Normal Distribution
68-95-99.7 (Emperical) Rule
z-Score
Raw Score

**Name:** _____

**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

**Solve the problem. Assume that the given distribution is normal.**

1) Assume that a distribution has a mean of 20 and a standard deviation of 6. What percentage of the values in the distribution do we expect to fall between 14 and 20?

2) Assume that a distribution has a mean of 24 and a standard deviation of 7. What percentage of the values in the distribution do we expect to fall between 24 and 38?

3) Due to random variations in the operation of an automatic hot chocolate machine, not every cup is filled with the same amount of hot chocolate. Assume that the mean amount dispensed is 12 ounces with a standard deviation of 0.7 ounces. What percentage of the cups should have more than 12.7 ounces of hot chocolate?

**Use a table to find the percentage of the area under the standard normal curve between the two values. Round your answer to the nearest tenth.**

4) $z = 0$ and $z = 1.12$

5) $z = 1.06$ and $z = 1.87$

**Use a table to find a z-score that fits the given conditions. Interpolate if necessary.**

6) 33% of the area under the standard normal curve is above the score.

7) 15% of the area under the standard normal curve is below the score.

**Find the missing value.**

8) 95 = mean
9 = standard deviation
99 = raw score
_____ = z-score

9) 61 = mean
6 = standard deviation
_____ = raw score
-0.77 = z-score

**Solve the problem.**

10) Suppose that for a particular brand of VCR, the distribution of product lifetime has a mean of 90 months and a standard deviation of 9. With respect to this distribution, 95 months corresponds to what z-score?

11) Assume that the mean length of a human pregnancy is 268 days with a standard deviation of 9 days. What percentage of human pregnancies do we expect to last no more than 260 days?

12) If you score an 80 on an examination that has a mean score of 73 and a standard deviation of 5, to what percentile does your score correspond?

13) Suppose that the mean salary in a particular profession is $45,000 with a standard deviation of $2,000. To what percentile does a salary of $48,000 correspond?

14) Assume that math SAT scores are normally distributed with a mean of 500 and a standard deviation of 100. If you scored 560, what percentage of those taking the test scored below you?