Practice 9.4: Normal Calculations Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Math 3

1. The lifetimes of zip drives marketed by ZipZap, Inc. are normally distributed with a mean lifetime of 18 months and a standard deviation of 3 months. The company plans to offer a new warranty guaranteeing the replacement of failed zip drives during the warranty period. The replacement of failed drives is costly, however, and the company can afford to replace only up to 4 percent of its drives.
2. What percentage of the drives will still be functioning after 2.5 years?
3. How many months of warranty should the company offer with these zip drives?
4. The weights of NCAA lacrosse players are approximately normally distributed with  and . For each of the following, illustrate with a picture and evaluate.
5. P (Weight > 200) \_\_\_\_\_\_\_\_\_\_
6. P (173  Weight  181) \_\_\_\_\_\_\_\_\_\_



1. P (Weight < 190) \_\_\_\_\_\_\_\_\_\_
2. The value of X if P (Weight > X) = 0.306. \_\_\_\_\_\_\_\_\_\_
3. The Graduate Record Examinations are widely used to help predict the performance of applicants to graduate schools. The range of possible scores on a GRE is 200 to 900. The psychology department finds that the scores of its applicants on the quantitative GRE are approximately normal with mean 544 and standard deviation 103. What minimum score would a student need in order to score in the top10% of those taking the test?
4. The best male long jumpers for State College since 1973 have averaged a jump of 263.0 inches with a standard deviation of 14.0 inches. The best female long jumpers have averaged 201.2 inches with a standard deviation of 7.7 inches. This year Joey jumped 275 inches and his sister, Carla, jumped 207 inches. Both are State College students. Assume that male and female jumps are normally distributed. Within their groups, which athlete had the more impressive performance? Explain.

**Directions:** Sketch the graph with $μ=266$ and $σ=16, $ which represents the distribution of pregnancy length from conception to birth for humans.

1. Using the empirical rule (the 68-95-99.7 rule), find the length of the longest 16% of all pregnancies. Sketch and shade a normal curve for this situation.
2. Find the length of the middle 99.7% of all pregnancies. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Find the length of the shortest 2.5% of all pregnancies. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. What percentile rank is a pregnancy of 218 days? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. What percentile rank is a pregnancy of 298 days? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. What is the percentile of a pregnancy of 266 days? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. What z-score does a pregnancy of 257 days have? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. What percent of humans have a pregnancy lasting less than 257 days? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. What percent of humans have a pregnancy lasting longer than 280 days? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
10. What percent of humans have a pregnancy lasting between 260 and 270 days? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. How long would a pregnancy have to last to be in the longest 10% of all pregnancies? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. How short would a pregnancy be to be in the shortest 25% of all pregnancies? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. How long would a pregnancy be to be in the middle 20% of all pregnancies? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_