Z-score worksheet:

1. Convert scores to z-scores (given X, M, SD):
   1. A psychologist wants to know how a student did on the new GRE exam. The student scored a 167 on the test, while the new mean is 150 questions with a standard deviation of 5. What is their z-score?
2. Convert Z to raw scores (given Z, M, SD):
   1. A soccer team normally scores 2.3 goals per game with a standard deviation of .74 goals. During a losing streak they are a standardized Z = -.65 behind their normal rate. How many goals did they score (yes it will be a decimal)?
3. Compare scores based on Z (given several X, M, SD):
   1. Cities want to compare their flu rates to see which place needs more flu shots sent. Chicago has a flu rate of 15 people (per thousand) with a mean and standard deviation of *M* = 10.2, *SD* = 5.8. Houston has a rate of 20 people per thousand with a mean of 22 and standard deviation of 1.5. Finally, Los Angeles has a rate of 10.1 people with a mean of 5.4 and standard deviation of 4.9 people. Which city needs more flu shots?
4. Percent above a z-score (either given Z, or given X, M, SD – first convert to Z):
   1. A person scored a 10 on a test of language skills with a mean of 8.7 and standard deviation of 1.2. How many people would normally score above this person?
   2. A second person scored a 5 on the same language test. How many people scored higher than this lower score?
5. Percent below a z-score (either given Z, or given X, M, SD – first convert to Z):
   1. In my college football league I normally correctly guess 15 games a week with a standard deviation of 2.5 games. This year I correctly guessed 18 games one week. How many of my guesses are below this new score?
   2. One week I did particularly bad and only got 10 games right when guessing. What percent of my guesses are below this off week?
6. Percent between two Z-scores (covert multiple Xs to Z):
   1. You are comparing credits card rates to pick the best ones for you. The average APR is 19.8% with a standard deviation of 1.4 percent. One card has a rate of 17% and another card has a rate of 22 percent. What percentage of rates are between these two cards?
   2. What percent of cards would be between a rate of 21 and 22.3 percent?
7. Find Z given a percentile:
   1. What z-score would you need to make to be in the top 2% percent? The top 10%?
8. Find a raw score given a percentile (first find Z, then convert to X):
   1. If the average number of cats per house is 1.3 with a standard deviation of .7 cats, how many cats would a person need to have to be a crazy cat lady in the top 3% of households?