Name_____ Date_____ Period_____

NORMAL DISTRIBUTION WORKSHEET #2

1. Suppose the distribution of GPAs at Jefferson High School has a mean of 2.7 and a standard deviation of 0.37. The GPAs at Washington High School has a mean of 2.8 and a standard deviation of 0.33.

   a. Ted, a student at Washington High School, has a GPA of 3.25, and Frank, at Jefferson High School, has a GPA of 3.17. Calculate the z-score for Ted and Frank and comment on which of them has the higher GPA relative to his peers.

   b. What GPA would Ted need to have the same z-score as Frank?

   c. Brandon, another student at Jefferson High School, has a GPA of 3.07. Assuming that these GPAs follow a mound-shaped distribution, approximately what proportion of Jefferson High School students have a larger GPA? (Use the empirical rule to answer this question.)

2. The EPA fuel economy estimates for automobile models tested recently predicted a Normal model with a mean of 24.8 mpg and a standard deviation of 6.2 mpg.

   a. In what interval would you expect the central 68% of autos to be found?

   b. About what percent of autos should get less than 31 mpg?

   c. What percent of cars should get between 31 and 37 mpg?

   d. What percent of cars should get more than 20 mpg?

3. A trucking firm determines that its fleet of trucks averages a mean of 12.4 miles per gallon with a standard deviation of 1.2 miles per gallon on cross-country hauls. What is the probability that one of the trucks averages fewer than 10 miles per gallon?
   (A) 0.0082
   (B) 0.0228
   (C) 0.4772
   (D) 0.5228
   (E) 0.9772

4. A factory dumps an average of 2.43 tons of pollutants into a river every week. If the standard deviation is 0.88 tons, what is the probability that in a week more than 3 tons are dumped?
   (A) 0.2578
   (B) 0.2843
   (C) 0.6500
   (D) 0.7157
   (E) 0.7422

5. An electronic product takes an average of 3.4 hours to move through an assembly line. If the standard deviation is 0.5 hour, what is the probability that an item will take between 3 and 4 hours?
   (A) 0.2119
   (B) 0.2295
   (C) 0.3270
   (D) 0.3811
   (E) 0.6730

6. The mean income per household in a certain state is $9500 with a standard deviation of $1750. The middle 95% of incomes are between what two values?
   (A) $5422 and $13578
   (B) $6070 and $12930
   (C) $6621 and $12379
   (D) $7260 and $11740
   (E) $8049 and $10951

7. Based on data concerning the performance of machines owned by the Zorro Company, it is known that the length of time a machine can go without repair is approximately normally distributed with μ = 350 hours and σ = 55 hours. What is the probability that the machine can go without repair for:

   a. less than 424 hours?

   b. between 198 and 302 hours?

   c. between 267 and 389 hours?

   d. more than 412 hours?

   e. What is the range of scores that we would expect 68% of the repair times to center around?