

# Stats #2

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

## Normal Distributions

SCORE:

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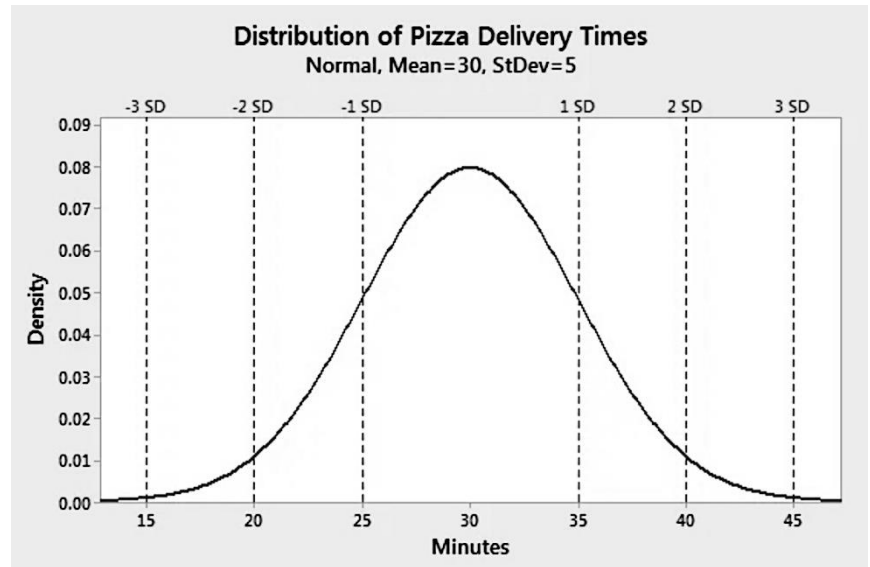
1. Each of the stories below are based upon normal distributions. Rank order these stories from most unusual to most average. (1 is the most unusual, 8 is the most average.) In each case, explain your ranking. The ranking depends on how many standard deviations from the mean the data point is.

Scenario	# of Standard Deviations from Mean	Rank (1-8)
The number of red loops in a box of Tutti-Frutti-O's is normally distributed with mean of 800 loops and standard deviation 120. Tony bought a new box, opened it, and counted 1243 red loops. (It didn't really matter because all the colors are the same flavor anyway.)		
The weight of house cats is normally distributed with a mean of 10 pounds and standard deviation 2.1 pounds. My cat, Big Boy, weighs 6 pounds.		
The lifetime of a battery is normally distributed with a mean life of 40 hours and a standard deviation of 1.2 hours. I just bought a battery and it died after just 20 hours		
The amount that a human fingernail grows in a year is normally distributed with a mean length of 3.5 cm and a standard deviation of 0.63 cm. My neighbor's thumbnail grew all year without breaking and it is 4.6 cm long with stars and stripes painted on it.		
My little brother was digging in the garden and found a giant earthworm that was 35 cm long. The length of earthworms is normally distributed with a mean length of 14 cm and a standard deviation of 5.3 cm.		
The mean length of a human pregnancy is 268 days with a standard deviation of 16 days. My aunt just had a premature baby delivered after only 245 days		
IQ scores for young adults on a famous IQ test are distributed normally with a mean of 110 and a standard deviation of 25. I'm pretty smart and my IQ is 135.		
The army measured head sizes among male soldiers and found that the distribution is pretty close to normal with a mean of 22.8 inches and standard deviation of 1.1 inches. Little Joe was almost too small to get into the army because his head size was only 20.6 inches.		

Use the information to answer the questions of the normal distributions.

2. The pizza delivery times is normally distributed with a mean of 30 and a standard deviation of 5.

- a. Is it more likely that the pizza delivery will take 20 minutes or 35 minutes?
- b. What percent of pizza delivery times take longer than 35 minutes?
- c. What percent of pizza delivery times will take between 15-20 minutes?
- d. What percent of pizza delivery times will take longer than 20 minutes?



3. The population of NBA players is Normally distributed with a mean of 6'7" and a standard deviation of 4 inches. (Wikipedia) Greg is considered unusually tall for his high school at 6' 3".

- a. Use this information to sketch a normal distribution curve for this test.



- b. What percent of NBA players are taller than Greg?
- c. What percent are shorter?
- d. How tall would Greg have to be in order to be in the top 2.5% of NBA player heights?

4. The average height of boys at Greg's school is 5'11" with a standard deviation of 2". Greg is 6'3". Assume the height is normally distributed.
- Use this information to sketch a normal distribution curve for this test.



b. What percent of students in the school are shorter than Greg?

c. What percent of students are between 5'5" and 5' 11"?

5. Jordan is drinking a cup of hot chocolate. From previous research, he knows that it takes an average time of 10 minutes for the hot chocolate to reach a temperature where his tongue will not burn. The time it takes the chocolate to cool varies Normally with a standard deviation of 2 minutes.
- Use this information to sketch a normal distribution curve for this test.



b. How long should he wait to drink his hot chocolate if he wants to be 84% sure that he won't burn himself?

c. If he waits 8 minutes, what percent of the time will he burn his tongue?

**Review: Law of Large Numbers**

6. You and your friend are rolling one die over and over again. After 6 rolls, your friend has rolled four fives. Are you surprised by these results? Explain.
  
7. After rolling the die 50 times, you know notice that you rolled a total of 20 fives. Are you surprised now? Explain.
  
  
8. You survey 100 people in your school and ask them if they feel your school has adequate parking. Only 30% of the sample feels the school has enough parking. If you have 728 students total in your school, how many would you expect out of all the student body that felt there was enough parking?