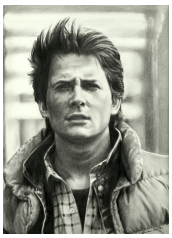
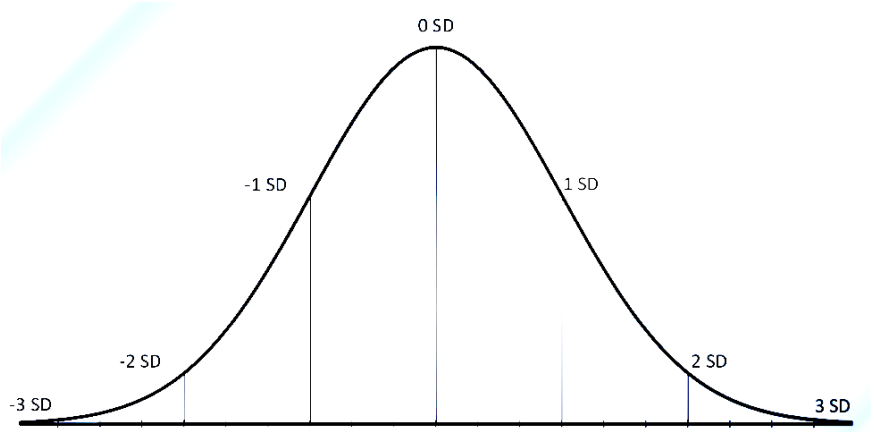
Will Marty Make it Back to the Future?



After accelerating for 20 seconds, a DeLorean sports car has a wide range of speeds that it can achieve, depending on traction. The distribution of speed follows an approximately Normal distribution with a mean of 80 mph and a standard deviation of 7.7 mph.

1. Label the appropriate values on the normal distribution



2. What percentage of the accelerations will give the Delorean a speed greater than 87.7 mph?

3. What percentage of accelerations will give the Delorean a speed between 64.6 mph and 87.7 mph?

4. What percentage of accelerations will give the Delorean a speed less than 64.6 mph?

5. What percentage of accelerations will give the Delorean a speed less than 68.45 mph?

6. In order to initiate time travel, the Delorean must hit at least 88 mph (which you probably know if you have seen the movie!) What percentage of accelerations will give the Delorean a speed of less than 88 mph (thus failing to time travel)?

7. What percentage of accelerations will give the Delorean a speed between 70 and 95 mph?

8. If Marty wants the Delorean to reach the speed representing the 90^{th} percentile of all possible speeds, what speed does he need to achieve?

9. Marty just accelerated and reached a speed of only 65 mph. He knows that this is a poor performance but he wants to know how poor. What percentile is a speed of 65 mph?

When professional golfer Jordan Spieth hits his driver, the distance the ball travels can be modeled by a Normal distribution with mean 304 yards and standard deviation 8 yards.

1. On a specific hole, Jordan would need to hit the ball at least 290 yards to have a clear second shot that avoids a large group of trees. What percent of Spieth's drives travel less than 290 yards? What percent travel more than 290 yards?

2. The top 10% of Spieth's drives achieve a distance of at least how many yards?