

Application exercise 6.1: Comparing Normal Curves

Team name: _____

Write your responses in the spaces provided below. WRITE LEGIBLY and SHOW ALL WORK! Only one submission per team is required. Concise and coherent are best!

Consider two people, Amy and Ben, who measure how many steps they take every day for a year. Both of them make a plot and see that the number of steps they each took for the year follow an approximately normal distribution. To visualize this, go to <http://www.rossmanchance.com/applets/NormCalc.html>.

How to use the applet

- In the box next to **Variable:**, type **Number of steps**.
- Let's say the mean number of steps Amy takes each day is 6000. In the first box next to **Mean:**, type 6000.
- Amy calculated the standard deviation of the number of steps she took to be 800. In the box next to **SD:**, type 800.
- The mean number of steps Ben took was 5500, with a standard deviation of 1000. Click the box next to the second line where it says **Mean:** and enter these numbers in their appropriate boxes.
- Click **Scale to Fit**.
- Amy wants to know how often she walked at least 5000 steps. Click the box next to **>**, and in the box under **x**, type 5000. Click any white space on the page. The box under **Probability** shows the approximate proportion of days of at least 5000 steps.
- Now Amy wants to know how often she walked less than 3000 steps. Click the box **>** so that it turns into **<**. Enter 3000 in the box under **x**. Click any white space on the page. The box under **Probability** shows the approximate proportion of days she walked under 3000 steps.
- Amy wants to know how often she walked between 4000 and 8000 steps. In the first row next to **<**, type 8000 under **x**. In the next row next to **<**, type 4000 under where you typed 8000. Click any white space on the page. The probability of her steps being between 4000 and 8000 is shown below, and the probability of being outside of that area is right below that.

Answer the following questions based on this applet.

1. How would you describe the shape of the distribution of Amy's steps?
2. Does the shape of the distribution of Ben's steps differ from the shape of Amy's steps? Why or why not?
3. Where are the centers of the curves for Amy's and Ben's steps, respectively?
4. Which curve is wider, and why?
5. Is the area under Amy's curve different from the area under Ben's curve? Explain.
6. Find the probability that Amy walked less than 5500 steps.

7. Without using the applet, find the probability that Ben walked less than 5500 steps. How do you know this to be true?

8. What is the probability that Amy walked more than 8000 steps?

9. What is the probability that Amy walked between 5200 and 6800 steps?

10. What is the probability that Amy walked between 4400 and 7600 steps?

11. What is the probability that Amy walked between 3600 and 8400 steps?