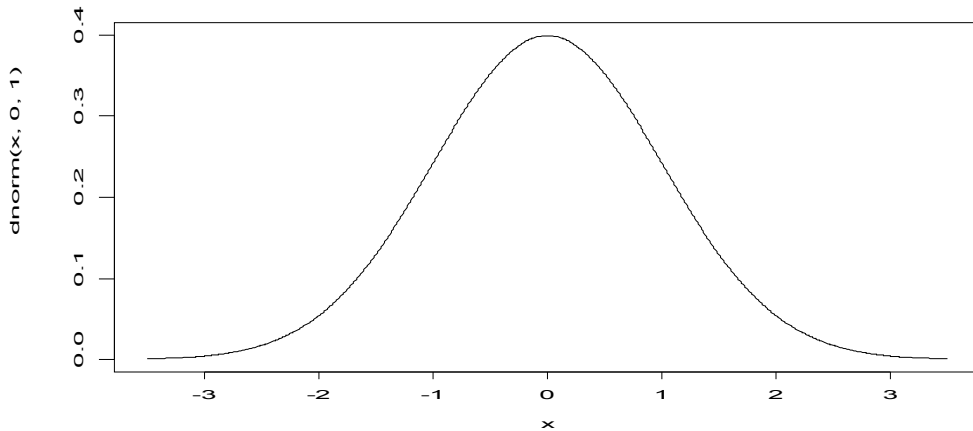


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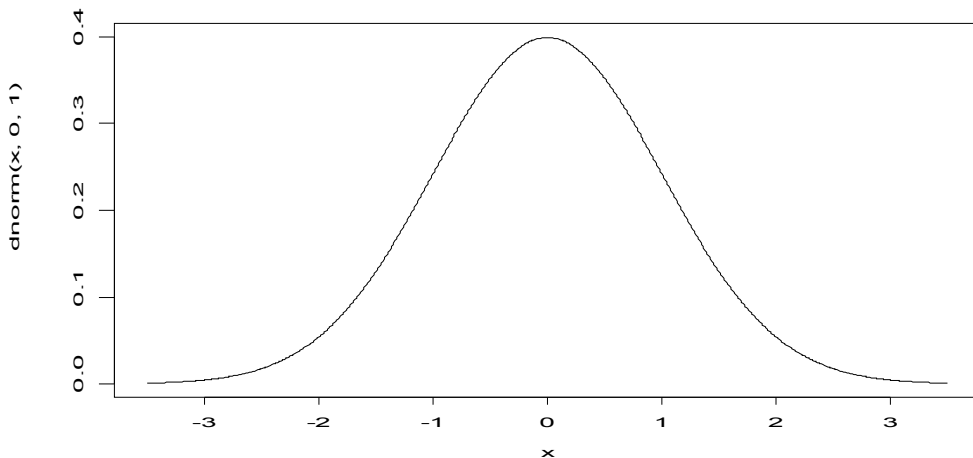
Mr. Simoneau - Normal Distribution – Worksheet 3

According to Harper's magazine, the time spent by kids in front of the television set per year can be modeled by a normal distribution with a mean equal to 1500 hours and a standard deviation equal to 250 hours.

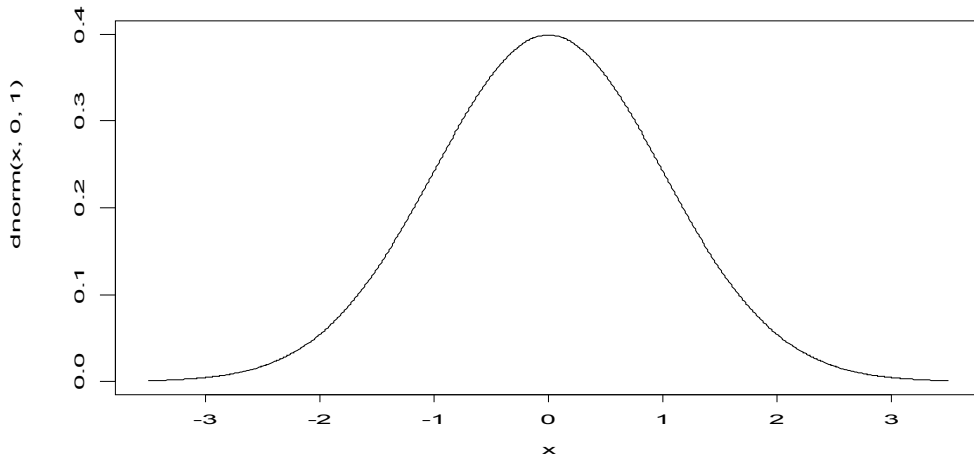
1. What percent of kids watch television for less than 1200 hours per year? (Clearly label the graph with the z-value and shade in the area that represents the percentage).



2. What percent of kids watch for more than 1650 hours? (Clearly label the graph with the z-value and shade in the area that corresponds to the percentage).

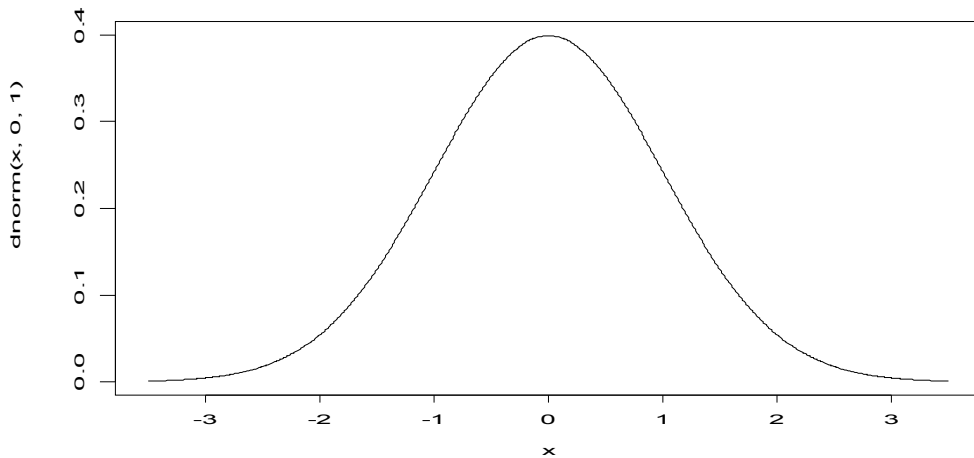


3. What percent of kids spend between 1200 and 1650 hours? (Clearly label the graph with the z-values and shade in the area that corresponds to the percentage).



(For questions 4 & 5) The distribution of heights of adult men is approximately normal with mean 69 inches and standard deviation 2.5 inches.

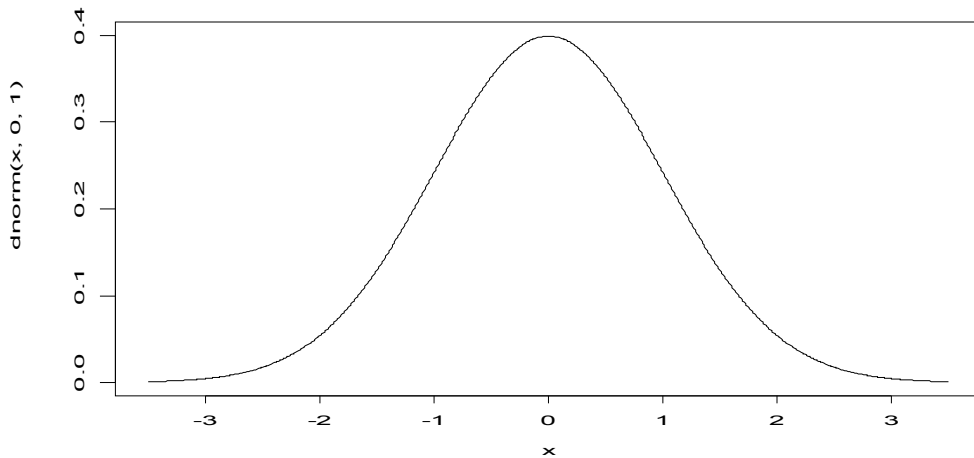
4. Draw a picture of this distribution, marking off where the mean height is, and showing one, two and three standard deviations above and below the mean.



5. Use the 68-95-99.7 rule to answer the following questions based on the situation: (i) What percent of men are taller than 74 inches? (ii) Between what two heights do the middle 95% of men fall? (iii) What percent of men are shorter than 66.5 inches?

A large college class has 900 students.. On the final exam, scores followed a normal distribution with an average of 63 and a standard deviation of 20.

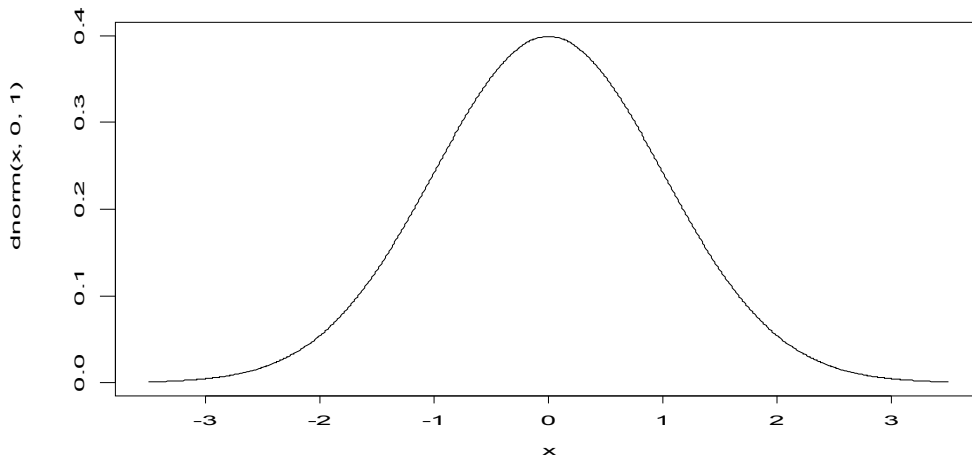
6. If you randomly select one of these students, what is the probability that the selected student scored between 56 and 70 on the final exam?



7. What is the minimum score needed for the 90th percentile?

Suppose that the wrapper of a candy bar lists its weight as 8 ounces. The actual weights of individual candy bars naturally vary to some extent, however. Suppose that these actual weights vary according to a normal distribution with mean 8.5 ounces and standard deviation .325 ounces.

- 8.. a) What proportion of the candy bars weigh less than the advertised 8 ounces?



- b) If the manufacturer wants to decrease this proportion from a) by changing the mean of its candy bar weights, should it increase or decrease that mean? Explain briefly, without performing any calculations.

c) If the manufacturer wants to decrease this proportion from a) by changing the standard deviation of its candy bar weights, should it increase or decrease that standard deviation? Explain briefly, without performing any calculations.

Items 9 to 14 refer to the following situation:

Scores on a popular mathematics achievement test given to 8th grade students are normally distributed with a mean = 150 and a standard deviation = 10.

9. Let us say you know an 8th grader who scores 135 on this test. What proportion of 8th graders would score lower than (or below) this student?

10. Let's say you know another 8th grader who scores 168 on this test. What proportion of 8th graders would score higher than (or above) this student?

11. What proportion of 8th grade students would you expect to score between 132 and 165 on this test?

12. If we apply the 68-95-99.7% rule, this shows us that 95% of 8th grade students will score between _____ and _____ on this mathematics achievement test.

13. Since you know this distribution of mathematics achievement test scores for 8th graders is normal, what would you expect the normal probability plot to look like?

14. Please determine how high a student would need to score on the 8th grade mathematics achievement test in order to be in the top 1% of the distribution of test scores.