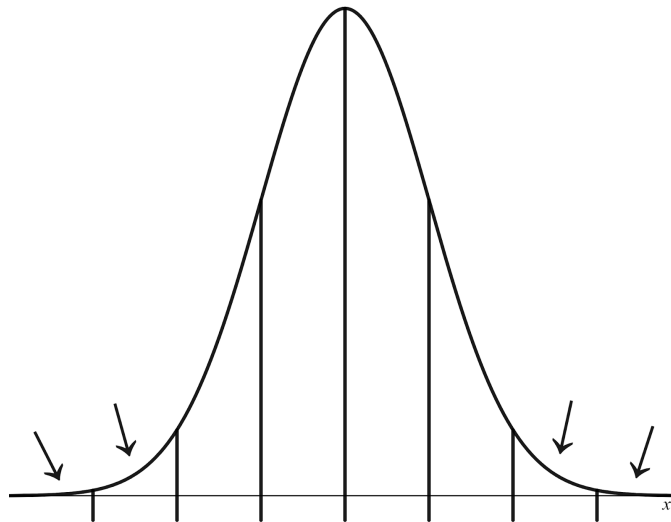


5.2.1: Exercises

1. The patient recovery time from a particular surgical procedure is normally distributed with a mean of 7 days and a standard deviation of 2.1 days.
 - a. Use this information and what you know about the normal distribution to label the tick marks on the horizontal axis, noting that the distance between each tick mark is 1 standard deviation.



Images are created with the graphing calculator, used with permission from Desmos Studio PBC.

- b. Remembering that the total area under the probability curve is always 1, label the area of each of the eight regions above according to the empirical rule.
- c. Suppose that x represents a random patient's recovery time from this surgery. Find $P(x < 4.9)$.
- d. Suppose that x represents a random patient's recovery time from this surgery. Find $P(0.7 < x < 4.9)$.
- e. Suppose that x represents a random patient's recovery time from this surgery. We want to know the probability that the patient recovers in between 0.7 and 9.1 days. Compute this probability and include probability notation in your answer.

f. Suppose that x represents a random patient's recovery time from this surgery. What proportion of patients recover in at most 13.3 days? Include probability notation in your answer.

g. Write a sentence interpreting the following probability in context: $P(x \geq 11.2)$.

h. Martha's recovery time has Z-score -2.1. Interpret this Z-score in context. Is Martha's recovery time unusual? Explain.

i. Compute the Z-score for a patient that recovers in 9.5 days. Is this recovery time unusual? Explain.

j. Give the range of unusually long recovery times.

k. Give the range of unusually short recovery times.

2. Weights of adult men and women in the US are normally distributed. The distribution of adult male weights has a mean of 200 lbs and a standard deviation of 9 lbs. The distribution of adult female weights has a mean of 170 lbs and a standard deviation of 7 lbs. Andy is a man who weighs 213 lbs and Anne is a woman who weighs 178 lbs. Who is heavier (relatively)? Justify your answer using Z-scores.

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