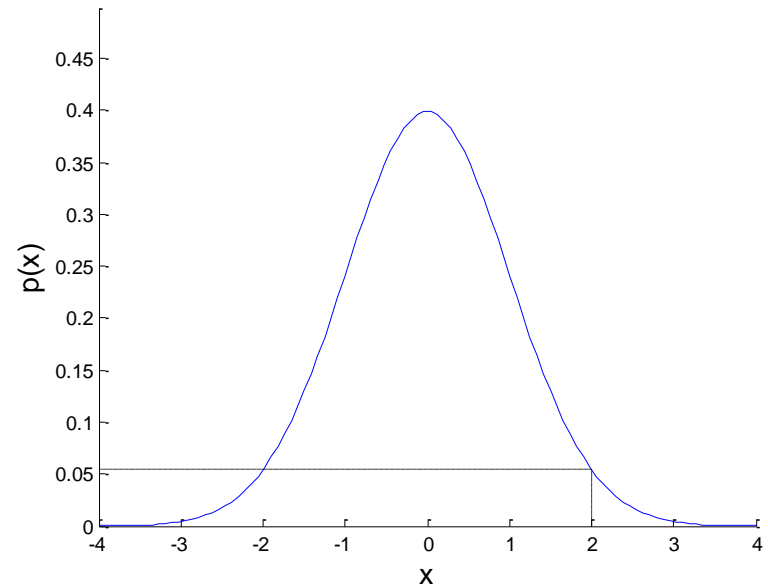


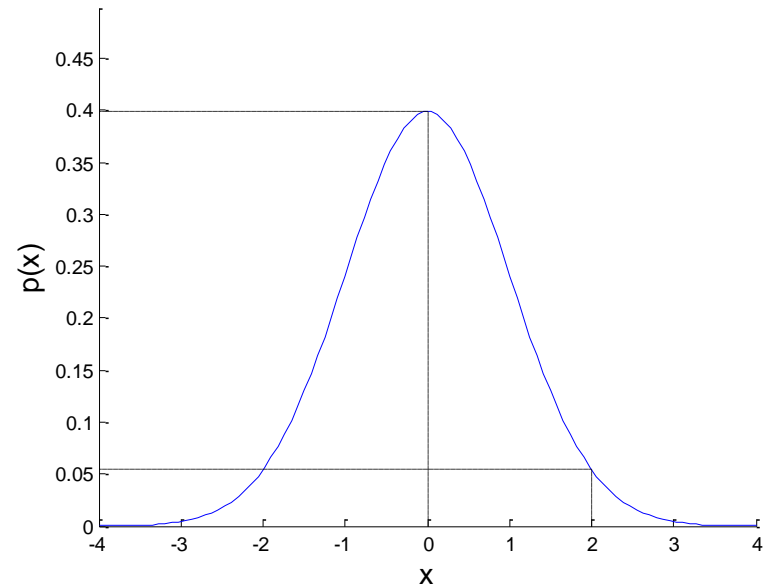
Exercise 1

- What is the likelihood of drawing a 2 from a random normal distribution with a mean of zero and a standard deviation of one?



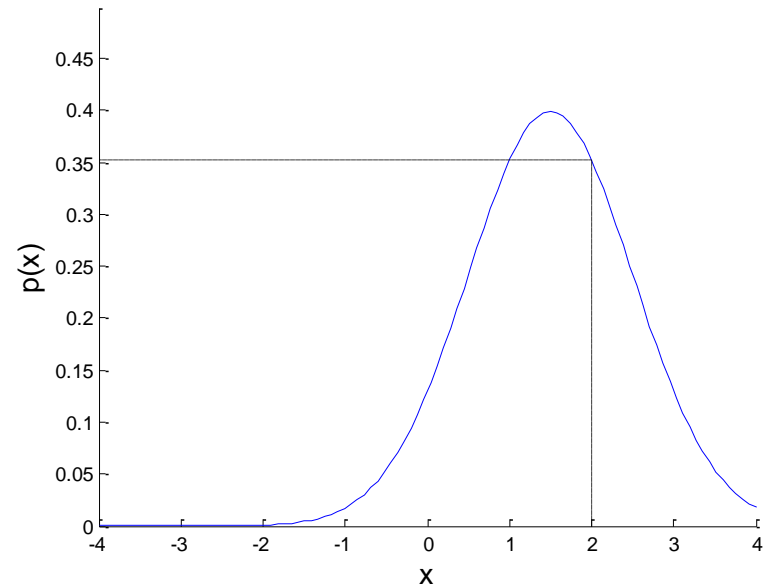
Exercise 2

- What is the likelihood of drawing a 2 and a 0 from a normal distribution with a mean of zero and a standard deviation of one?



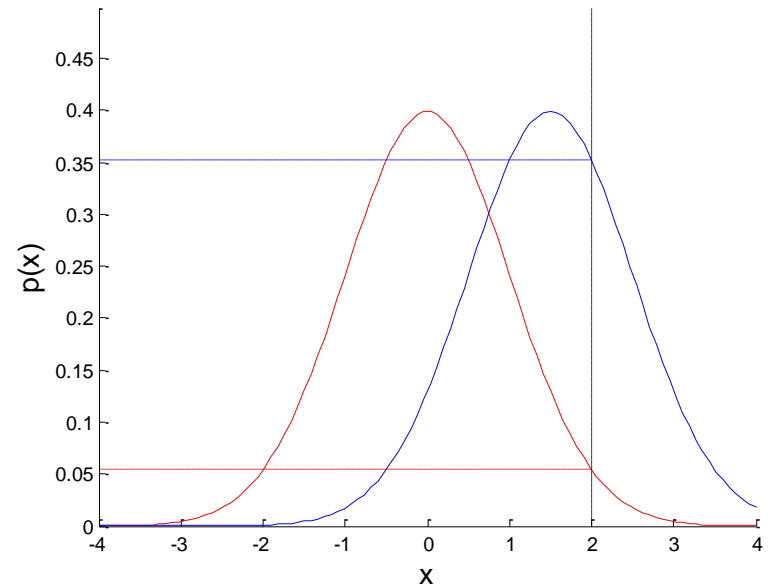
Exercise 3

- What is the likelihood of drawing a 2 from a normal distribution with a mean of 1.5 and a standard deviation of 1?



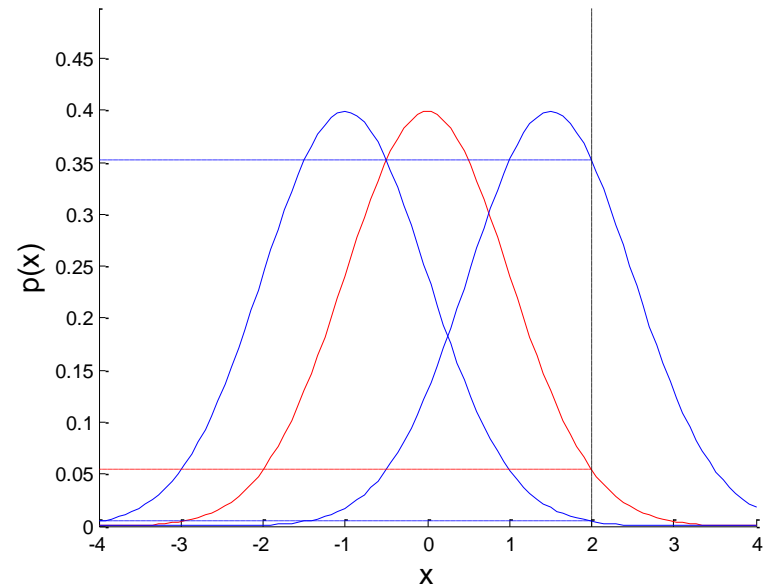
Exercise 4

- I toss a coin, where the probability of heads is 0.5 and the probability of tails is 0.5.
- If the coin comes up heads, I draw a number from a normal distribution with a mean of zero and a standard deviation of 1.
- If the coin comes up tails, I draw a number from a normal distribution with a mean of 1.5 and a standard deviation of 1.
- I toss the coin and, based on the coin toss results, I select the appropriate distribution and draw the number 2.
- What are the odds that I tossed tails relative to the odds that I tossed heads given that I drew a 2?



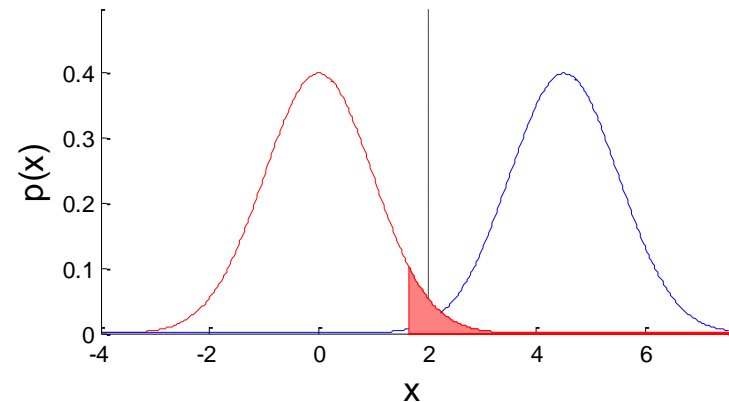
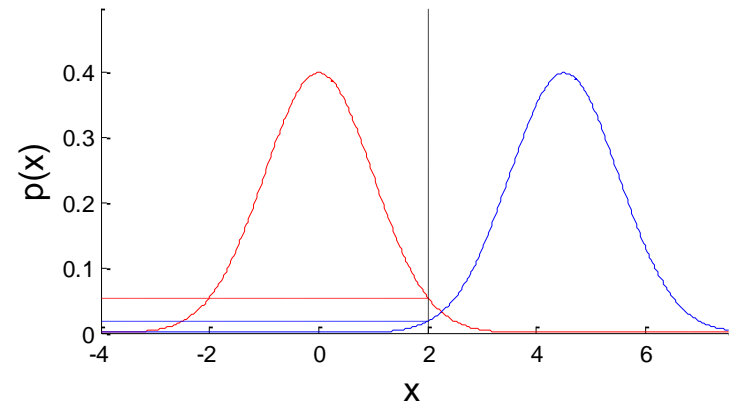
Exercise 5

- I toss a coin, where the probability of heads is 0.5 and the probability of tails is 0.5.
- If the coin comes up heads, I draw a number from a normal distribution with a mean of zero and a standard deviation of one.
- If the coin comes up tails, I draw a number from either a normal distribution with a mean of 1.5 and a standard deviation of 1, or from a normal distribution with a mean of -1 and a standard deviation of 1, with equal probability.
- I toss the coin and, based on the coin toss results, I select the appropriate distribution and draw the number 2.
- What are the odds that I tossed tails relative to the odds that I tossed heads given that I drew a 2?



Exercise 6

- I toss a coin, where the probability of heads is 0.5 and the probability of tails is 0.5.
- If the coin comes up heads, I draw a number from a normal distribution with a mean of zero and a standard deviation of one.
- If the coin comes up tails, I draw a number from a normal distribution with a mean of 4.5 and a standard deviation of 1.
- I toss the coin and, based on the coin toss results, I select the appropriate distribution and draw the number 2.
- What are the odds that I tossed tails relative to the odds that I tossed heads given that I drew a 2?
- What is the area under the normal distribution for heads at or beyond a value of 2?
- Is this area less than 0.05?
- Does the fact that the sampled value of 2 lies in a region that is less than 5% of the area under the curve mean that it is more likely to have arisen from the tails distribution?



Exercise 7

- A newly-wed couple is trying to have a baby. They try really hard on their first night together and, after waiting the appropriate amount of time, they conduct a pregnancy test.
- The test comes out positive. What is the probability of pregnancy?



Exercise 7

