# Unit 5: Statistics

5.6b More Practice

**Video:** Punishment or Reward?

Explain "Regression to the Mean"

Example:
Jennifer always waits until her gas tank is nearly empty before refuelling. She keeps track of the distance she drives on each tank of gas. The distance varies depending on the weather and the amount she drives on the highway. The distance has a mean of 520 km and a standard deviation of 14 km. What percent of the time does Jennifer drive **between** 492 km and 520 km on a tank of gas?

Methoda) Sketch a normal curve to show the distribution of the driving distances for a tank of gas. Mark the kilometres driven for values that are 1, 2, and 3 standard deviations from the mean. Shade the area between 492 and 520, then estimate the correct answer.
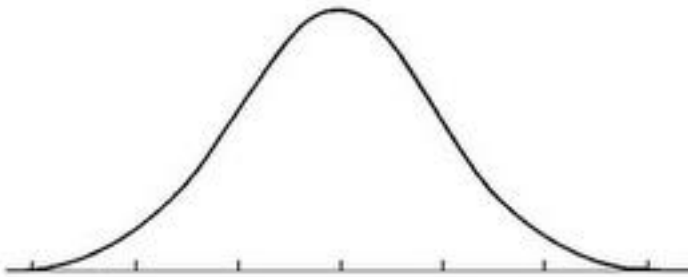
Methodb) Recreate this graph on your calculator. Shade the area between 492 and 520 to calculate the answer.
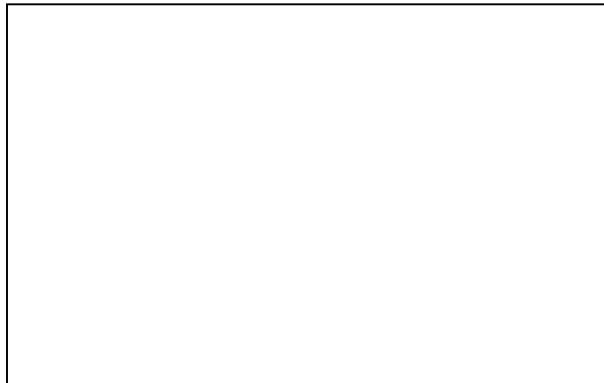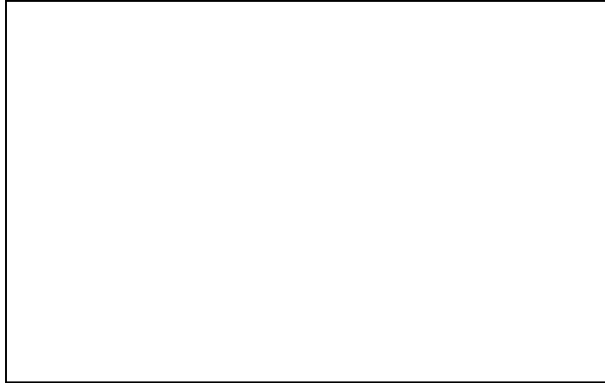
Xmin =
Xmax =

Ymin =
Ymax =

Method**c**) Find the z-score for both 492 and 520. Use the z-score table to calculate the area under the bell curve.

Method**d**) Graph the normal distribution on your calculator (mean = 0, standard deviation = 1). Then shade the area between the two z-scores to calculate the answer
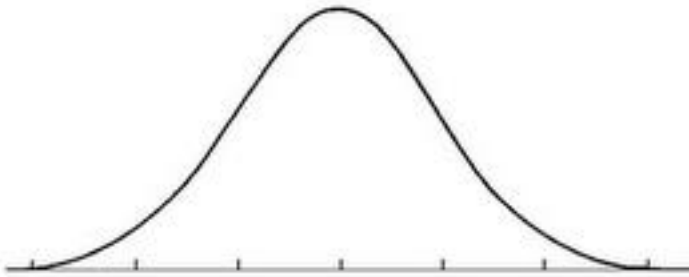
Xmin =
Xmax =

Ymin =
Ymax =

Method**e**) Use the normalcfd() function on your calculator to check the answer.

Assignment 1:

A teacher is analyzing the class results for a math test. The marks are normally distributed with a mean (μ) of 74 and a standard deviation of 6. What percent of the class got between 80% and 86% on the test?

Methoda) Sketch a normal curve to show the distribution test scores. Mark the scores for values that are 1, 2, and 3 standard deviations from the mean. Shade the area between 80 and 86, then estimate the correct answer.

Methodb) Recreate this graph on your calculator. Shade the area between 80 and 86 to calculate the answer.
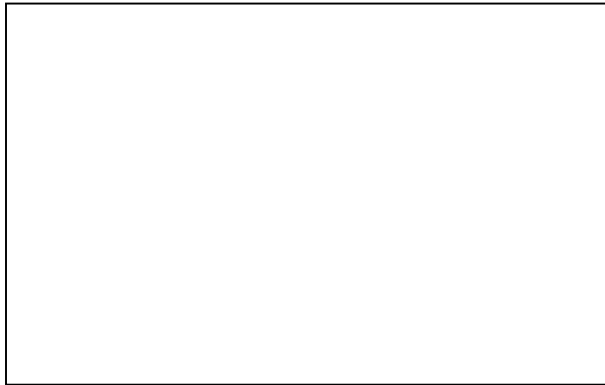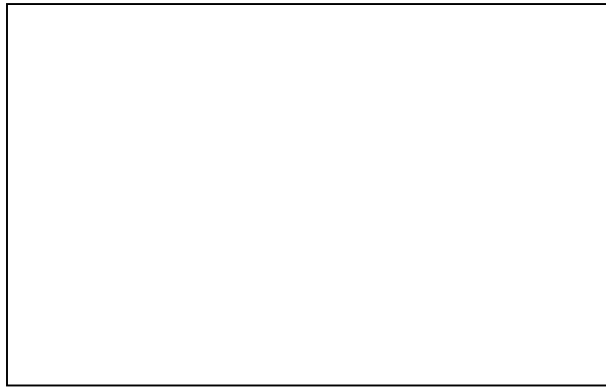
Xmin =
Xmax =

Ymin =
Ymax =

Methodc) Find the z-score for both 80 and 86. Use the z-score table to calculate the area under the bell curve.

Methodd) Graph the normal distribution on your calculator (mean = 0, standard deviation = 1).
Then shade the area between the two z-scores to calculate the answer
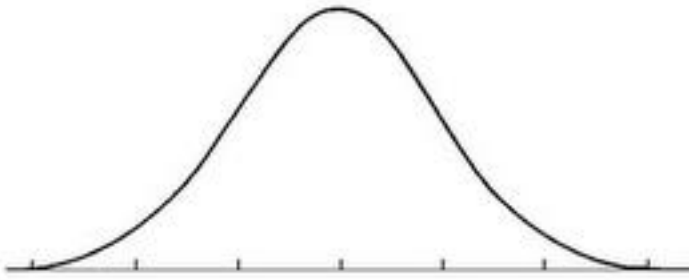
Xmin =
Xmax =

Ymin =
Ymax =

Methode) Use the normalcfd() function on your calculator to check the answer.

Assignment 2:

The average mark on a test is 75% with a standard deviation of 5. What is the probability of getting over 80% on the test?

Methoda) Sketch a normal curve to show the distribution of the test scores. Mark the scores for values that are 1, 2, and 3 standard deviations from the mean. Shade the area above 80, then estimate the correct answer.

Methodb) Recreate this graph on your calculator. Shade the area above 80 to calculate the answer.
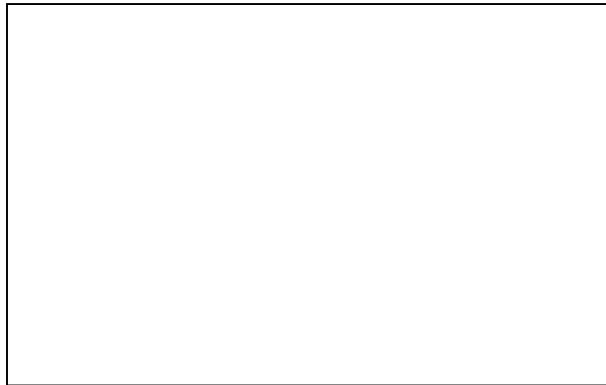
Xmin =
Xmax =

Ymin =
Ymax =

Methodc) Find the z-score for 80. Use the z-score table to calculate the area under the bell curve.

Methodd) Graph the normal distribution on your calculator (mean = 0, standard deviation = 1).
Then shade the area above the z-score to calculate the answer
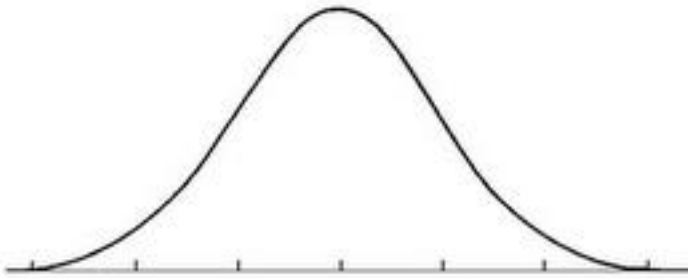
Xmin =
Xmax =

Ymin =
Ymax =

Methode) Use the normalcfd() function on your calculator to check the answer.

Assignment 3:

A manufacturer of TV's wants to know how long to make a warranty. The TV's last an average of 5.5 years with a standard deviation of 0.75. The manufacturer does not want more than 2.5% of TV's to be covered under warranty.

Methoda) Sketch a normal curve to show the distribution of the TV lifetimes. Mark the times for values that are 1, 2, and 3 standard deviations from the mean. Estimate the area representing 2.5%, then estimate the correct answer.

Methodb) Recreate this graph on your calculator. Use the invNorm() function to calculate the correct answer. Then shade the area below that to confirm the answer is 2.5%.
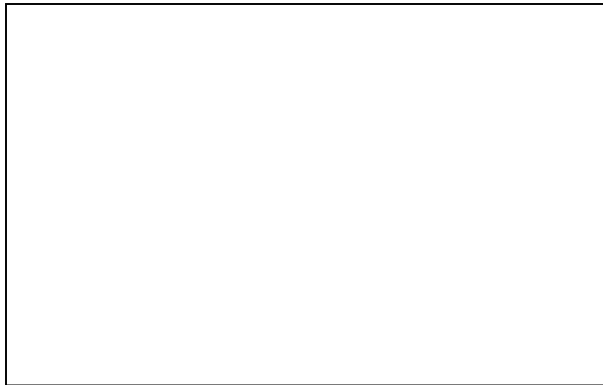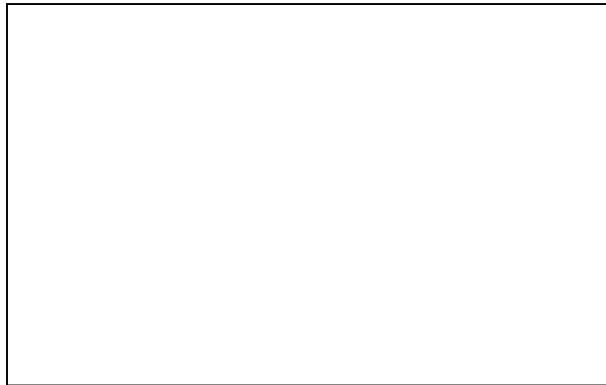
Xmin =
Xmax =

Ymin =
Ymax =

Methodc) Find the z-score for 2.5%. Calculate the length of time using the formula.

Methodd) Graph the normal distribution on your calculator (mean = 0, standard deviation = 1).
Then shade the area below the z-score to calculate the answer

Xmin =
Xmax =

Ymin =
Ymax =