

Empirical Rule WS

1. Given an approximately normal distribution what percentage of all values are within 1 standard deviation from the mean?
2. Given an approximately normal distribution what percentage of all values are within 2 standard deviations from the mean?
3. Given an approximately normal distribution what percentage of all values are within 3 standard deviations from the mean?
4. Given an approximately normal distribution with a mean of 175 and a standard deviation of 37.
 - a) Draw a normal curve and label 1, 2, and 3 standard deviations on both sides on the mean.
 - b) What percent of values are within the interval (138, 212)?
 - c) What percent of values are within the interval (101, 249)?
 - d) What percent of values are within the interval (64, 286)?
 - e) What percent of values outside the interval (138, 212)?
 - f) What percent of values are outside the interval (101, 249)?
 - g) What percent of values are outside the interval (64, 286)?

5. Given an approximately normal distribution with a mean of 121 and a standard deviation of 40.
- Draw a normal curve and label 1, 2, and 3 standard deviations on both sides on the mean.
 - What interval contains 68% of all values?
 - What interval contains 95% of all values?
 - What interval contains 99.7% of all values?
 - What percent of values are above 201?
 - What percent of values are below 81?
6. Given an approximately normal distribution with a mean of 159 and a standard deviation of 70.
- What percent of values are within the interval (89, 299)?
 - What percent of values are within the interval (19, 159)?
 - What interval contains 99.7% of all values?
 - What percent of values are above 229?
 - What percent of values are outside the interval (19, 229)?

7. The heights of male students is normally distributed with a mean of 170 cm and a standard deviation of 8 cm. Find the percentage of male students whose height is: (Draw and label a bell curve to help)

a) between 162 cm and 170 cm

b) between 170 cm and 186 cm

c) between 178 cm and 186 cm

d) less than 162 cm

e) less than 154 cm

f) greater than 162 cm

8) It is known that when a specific type of radish is grown in a certain manner without fertilizer the weights of the radishes produced are normally distributed with a mean of 40g and a standard deviation of 10g. When the same type of radish is grown in the same way except for the inclusion of fertilizer, it is known that the weights of the radishes produced are normally distributed with a mean of 140g and a standard deviation of 40g. Determine the proportion of radishes grown: (Draw the distribution)

a) Without fertilizer with weights less than 50 grams.

b) With fertilizer with weights less than 60 grams.

c) With and without fertilizer with weights between 20 and 60 grams.

d) With and without fertilizer that will have weights greater than or equal to 60 grams.

9. A bottle filling machine fills, on average, 20,000 bottles a day with a standard deviation of 2000. If we assume that the production is normally distributed and that a year comprises 260 working days, calculate the approximate number of working days that: (Draw the distribution)

a) under 18000 bottles are filled

b) over 16000 bottles are filled

c) between 18000 and 24000 bottles are filled