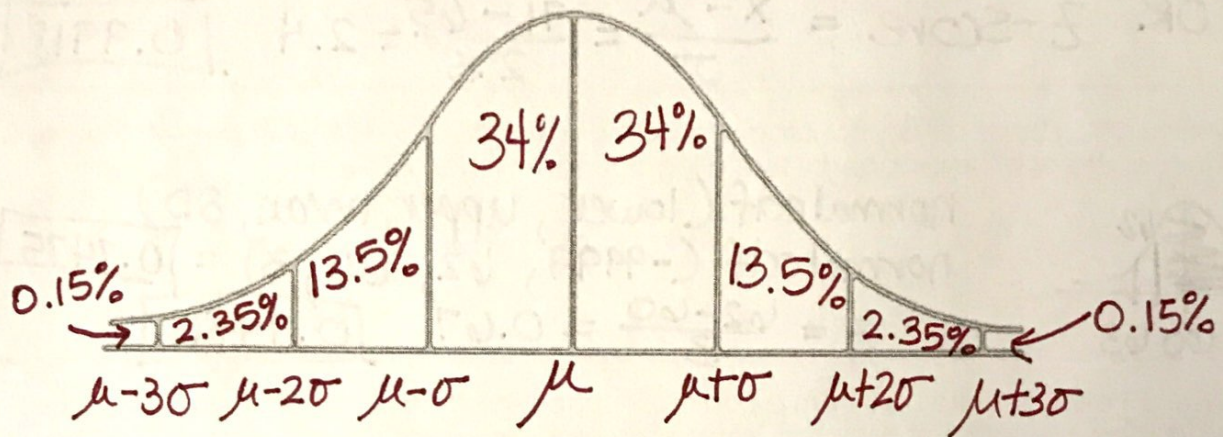


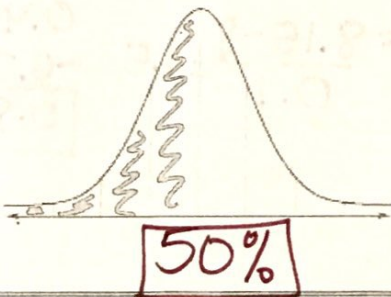
Normal Distribution Notes

Normal Curve:

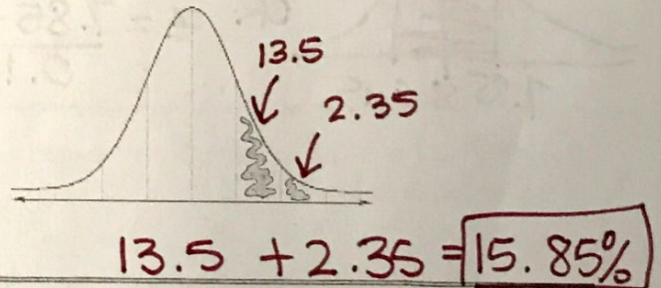
- Modeled by a bell-shaped curve.
- Symmetrical about the mean μ .
- Each area is determined by adding or subtracting the standard deviation, σ .
- Total area under the curve is 100%



1.



2.



3. A normal distribution has a mean of 18 and a standard deviation of 3. Find the probability that a randomly selected x-value from the given distribution is in the interval.

a) Between 12 & 18

$$13.5 + 34 = 47.5\%$$

$$\boxed{.475}$$

b) At least 21

$$13.5 + 2.35 + 0.15 = 16\%$$

$$\boxed{.16}$$



c) At most 12

$$0.15 + 2.35 = 2.5\%$$

$$\boxed{.025}$$

d) Between 9 and 21

$$2.35 + 13.5 + 34 + 34 = 83.85\%$$

$$\boxed{.8385}$$

4. The heights of 3000 women at a particular college are normally distributed with a mean of 65 inches and a standard deviation of 2.5 inches

a) About what percent of college women have heights below 70 inches?

$$0.15 + 2.35 + 13.5 + 34 + 34 + 13.5 = \boxed{97.5\%}$$

$$\text{OR } 100 - 2.35 - 0.15 = \boxed{97.5\%}$$

b) About how many college women have heights between 60 inches and 65 inches?

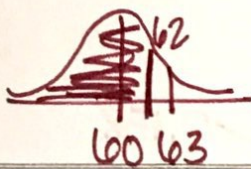
$$13.5 + 34 = \boxed{47.5\%}$$

c) What is the probability that a woman in this college would have a height less than 71 inches?

$$\text{normalcdf}(-9999, 71, 65, 2.5) = 0.9918$$

$$\text{OR } z\text{-score} = \frac{x - \mu}{\sigma} = \frac{71 - 65}{2.5} = 2.4 \quad \boxed{0.9918}$$

5. A particular leg bone for dinosaur fossils has a mean length of 60 feet with standard deviation of 3 inches. What is the probability that a leg bone is less than 62 feet?

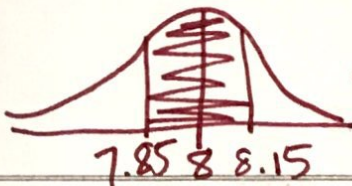


normalcdf(lower, upper, mean, SD)

$$\text{normalcdf}(-9999, 62, 60, 3) = \boxed{0.7475}$$

$$\text{OR } z = \frac{62 - 60}{3} = 0.67 \quad \boxed{0.7486}$$

6. The weight of chocolate bars from a particular chocolate factory has a mean of 8 ounces with standard deviation of .1 ounce. What is the probability that a randomly selected bar is between 7.85 and 8.15 ounces?



$$\text{normalcdf}(7.85, 8.15, 8, 0.1) = \boxed{0.8664}$$

$$\text{OR } z = \frac{7.85 - 8}{0.1} = -1.5$$

$$z = \frac{8.15 - 8}{0.1} = 1.5$$

$$\begin{array}{r} 0.9332 \\ -0.0668 \\ \hline \boxed{0.8664} \end{array}$$

7. The grades on a statistics midterm exam were normally distributed with a mean of 72 and a standard deviation of 8.

a. What is the proportion of students received a B grade.

b. What is the probability that a randomly selected student received between a 65 and 85?

c. What is the proportion of students that failed the exam?