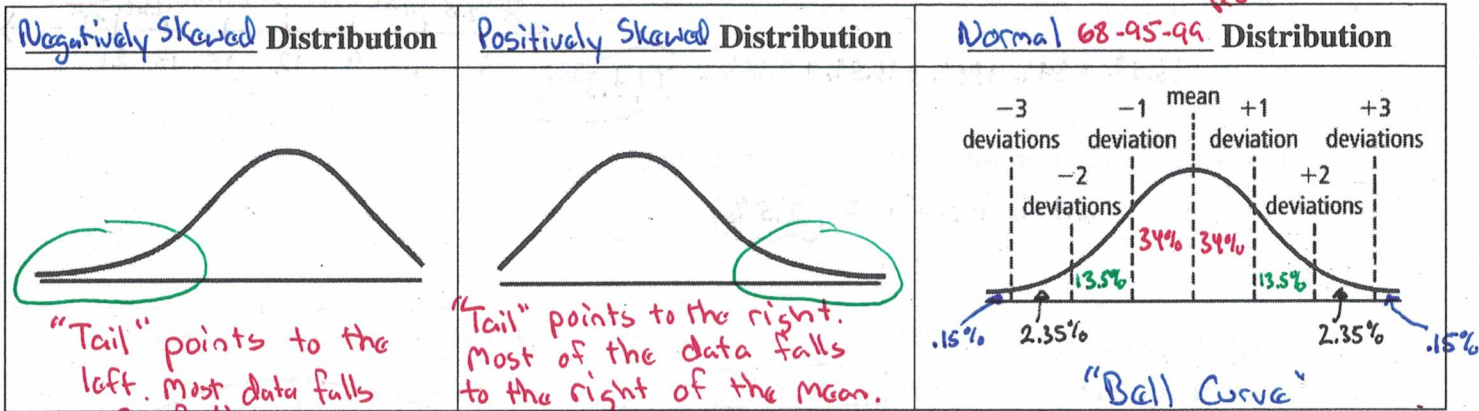


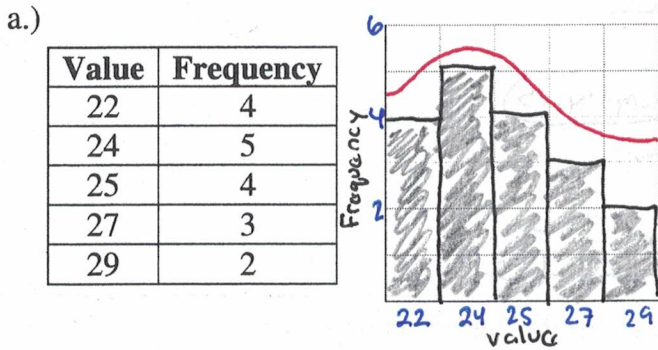
3.5 – The Normal Distribution

– continuous probability distribution → occurs when the outcome can be a value in an interval

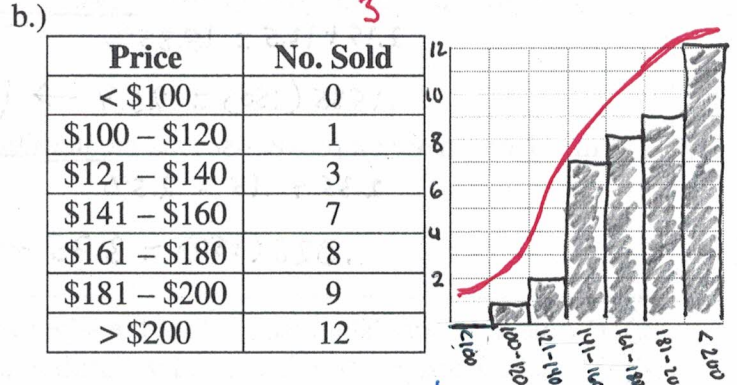
- Never represented by a histogram (bar graph where there are no gaps)
- Always represented by a CURVE!, below are some examples of these...



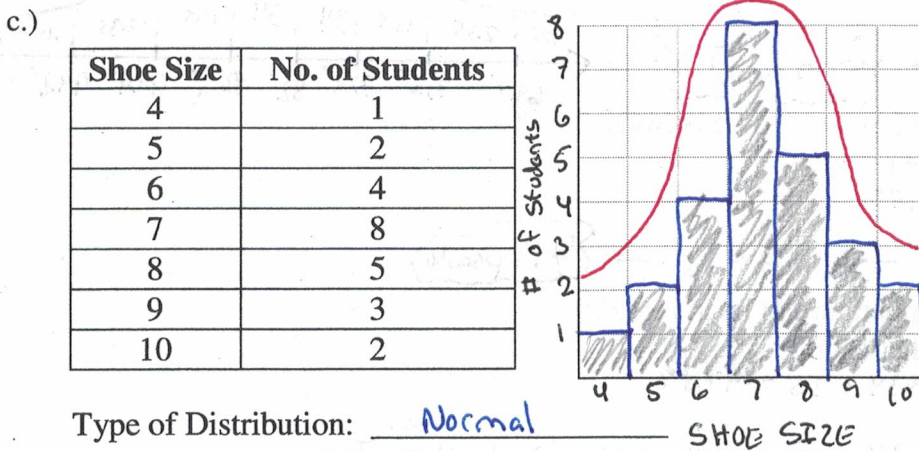
Example 1: Using the given table, make a histogram. Determine if the type of distribution. If it's a normal distribution – draw a normal curve with at least standard deviations.



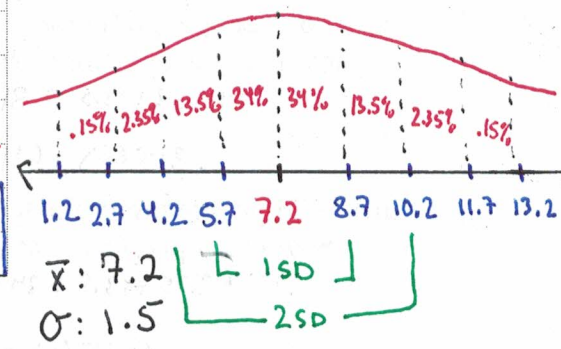
Type of Distribution: Positively Skewed



Type of Distribution: Negatively Skewed



Type of Distribution: Normal



* Need to find \bar{x} and σ .

Example 2: Use the Normal Distribution Curve to complete each problem.

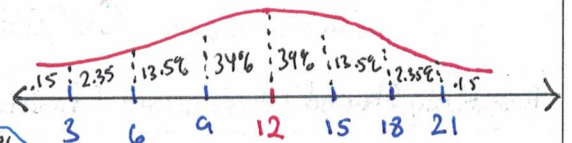
a.) The shelf-life of a particular dairy product has a mean of 12 days and a standard deviation of 3 days.

i.) What percent of products last between 3 and 12 days?

$$2.35\% + 13.5\% + 34\% = 49.85\%$$

ii.) What percent of products last between 6 and 21 days?

$$13.5\% + 34\% + 34\% + 13.5\% + 2.35\% = 97.35\%$$



iii.) What percent of products last more than 18 days?

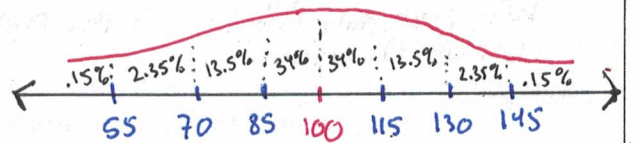
$$2.35\% + .15\% = 2.5\%$$

b.) The scores on a test given to 150 employees have mean of 100 and a standard deviation of 15.

i.) How many employees scored less than 115?

step 1 $.15 + 2.35 + 13.5 + 34 + 34 = 84\%$

step 2 $.84(150) = 126 \text{ employees}$



ii.) How many employees scored between 55 and 85?

$$2.35 + 13.5 = 15.85\%$$

$$.1585(150) = 23.7 \rightarrow 23 \text{ employees}$$

iii.) How many employees scored greater than 130?

$$2.35 + .15 = 2.5\%$$

$$.025(150) = 3.75 \rightarrow 3 \text{ employees}$$

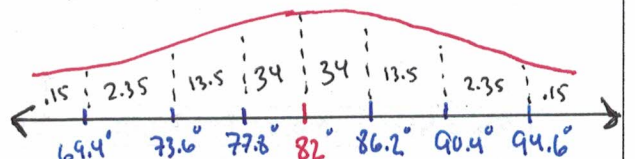
c.) People at a local lake resort prefer the lake to have a specific surface temperature.

The lake's temperature is normally distributed with a mean of 82° and a standard deviation of 4.2° .

i.) If 80 people prefer the temperature to be at least 86.2° , how many people are at the resort?

step 1 $13.5 + 2.35 + .15 = 16\%$

step 2 $.16(x) = 80 \rightarrow 500 \text{ people}$



ii.) If 611 people prefer the temperature to be between 77.8° and 90.4° , how many people are at the resort?

$$34 + 34 + 13.5 = 81.5\%$$

$$.815(x) = 611 \rightarrow \approx 749.63 \rightarrow 749 \text{ people}$$

iii.) If 24 people prefer the temperature to be at most 90.4° , how many people are at the resort?

$$.15 + 2.35 + 13.5 + 34 + 34 + 13.5 = 97.5\%$$

$$.975(x) = 24 \rightarrow \approx 24.615 \rightarrow 24 \text{ people}$$