# GGG - Inv. 4.2 Notes

**$y = (\text{decay factor}^x) \cdot (\text{y-intercept})$ -** Used for **exponential decay**
**$y = (\%\ \text{remaining as a decimal}^x) \cdot (\text{y-intercept})$**

**Exponential Decay:** An exponential pattern where the quantity **decreases** at each stage by a constant factor.

**Decay Factor:** This is the amount multiplied by each time. It is expressed as a fraction.
**Example:** The ballot size in Problem 4.1 decreased by 1/2 with each cut.

**Rate of Decay:** This is the **percent of decrease**. It's always greater than 0 but less than 100%. As a decimal it's larger than 0 but smaller than 1.
**Example:** The ballot size in Problem 4.1 decreased 50% or 0.50 with each cut.

$$\text{Rate of Decay} = \frac{\text{Change in the data}}{\text{Starting value in the data}}$$

**Example:** % of change in the population = $\frac{\text{Change in the population}}{\text{Starting population}}$

## TO CHANGE DECAY FACTOR TO RATE of DECAY:

**Change the decay factor to a decimal then change it to a % by multiplying by 100. Then subtract 100.**

**Example:**

Decay Factor of 2/3

0.67 x 100 = 67%. Then - 100 = 33%

So the rate of decay is 33%

## TO CHANGE RATE OF DECAY TO DECAY FACTOR:

**Change to a decimal by ÷ 100. Then subtract from 1.**

**Example:**

Rate of decay of 90%

90% = 0.90. Then subtract from 1.

So the decay factor is 0.1