# SA - DRVs

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| **What is expected value?** | The theoretical mean of a random variable.  *Hence it's not exactly based on sample data. The more tests you perform, the closer the mean of all your outcome will become to the expected value.* |
| **What is a probability mass function?** | A function giving exact values for discrete random variables. |
| **How is the expected value calculated under DRVs?** | * Multiply each value by its probability of occurring.     *This is why E(X2) or E(X-1) works* |
| **What is the expectation of… aX ± b?** | E(aX + b) = aE(X) ± b |
| **What is the expectation of… X ± Y? When is this the case?** | E(X ± Y) = E(X) ± E(Y)  This is as long as they’re independent. |
| **What is the formula for variance (σ2)?** | *“The mean of the squares minus the square of the means.”* |
| **What is the variance of… aX+b?** | a2Var(X)  Adding a constant doesn’t affect the variability of X. |
| **What is the variance of… X ± Y? When is this the case?** | Var(X) + Var(Y)  This is as long as they’re independent. |
| **What is the equation for the expectation of a discrete uniform distribution?** |  |
| **What is the equation for the variance of a discrete uniform distribution?** |  |
| **Prove the equation for the expectation of discrete uniform distribution** |  |
| **Prove the equation for the variance of discrete uniform distribution** |  |