Cheat Sheet

Probability

$$Prob(\text{event}) = \frac{\text{\# of ways event can happen}}{\text{total \# of possible outcomes}}$$

Rule	Expression
complement	$P(A^c) = 1 - P(A)$
multiplication	$P(A \text{ and } B) = P(B\|A)P(A)$
addition	$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$
independence	P(B|A) = P(B)

Binomial Formula

$$\frac{n!}{k!(n-k)!}p^k(1-p)^{n-k}$$

where:

- n: number of trials
- p: probability of success
- k: number of successes

SD for box with two types of tickets

$$SD = (\text{big number} - \text{small number}) \times \sqrt{\text{fraction big number} \times \text{fraction small number}}$$

Sum of draws

- EV for sum = number of draws $\times$ (Average of box)
- SE for sum = $\sqrt{\text{number of draws}} \times$ (SD of box)

Percentage (typically of ticket 1)

- EV for % = (Average of box) $\times$ 100%
- SE for % = $\left(\text{SD of box}/\sqrt{\text{number of draws}}\right) \times 100\%$