

8-7 PROBABILITY

Probability - $P(A) = \frac{\text{\# of possible outcomes}}{\text{\# of total outcomes}}$

$$P(\text{heads}) = \frac{1}{2}$$

Probability is always a number between 0 and 1

If $P(A)$ is the probability of something happening, $P(A')$ is the probability it doesn't happen. $P(A') = 1 - P(A)$

Ex 1 What is the probability of picking an ace from a standard deck of cards?

$$P(\text{ace}) = \frac{4}{52} = \frac{1}{13} \text{ OR } .076$$

Ex 2 What is the probability of rolling two dice and getting a sum of 10?



	1	2	3	4	5	6	
2							$P(10) = \frac{3}{36}$ $\frac{1}{12} \text{ OR } .027$
3							
4							
5							
6							
7							

The probability of independent events:

$$\begin{aligned} P(A \text{ and } B) &= P(A) \times P(B) \\ &= P(A \cap B) \end{aligned}$$

Ex 3 What is the probability of rolling a die and getting a 3 and flipping a coin and getting a tails?

$$\frac{1}{6} \cdot \frac{1}{2} = \boxed{\frac{1}{12}}$$

The probability of the union of two events:

$$\begin{aligned}P(A \text{ or } B) &= P(A) + P(B) - P(A \cap B) \\ &= P(A \cup B)\end{aligned}$$

Ex 4 What is the probability of rolling a die and getting a 3 or flipping a coin and getting a tails?

$$\begin{aligned}\frac{1}{6} + \frac{1}{2} - \frac{1}{12} &= \frac{2}{12} + \frac{6}{12} - \frac{1}{12} = \frac{7}{12}\end{aligned}$$

Ex 5 What is the probability of drawing four aces from a standard deck of cards?

$$\begin{aligned}\frac{4}{52} \cdot \frac{3}{51} \cdot \frac{2}{50} \cdot \frac{1}{49} \\ \frac{24}{6,497,400}\end{aligned}$$

HOMEWORK
p.645
#7-30