

HW: Worksheet/1-20, 24, 28, 29

You are dealt two cards from a deck. What is the probability that you are given a pair of aces?

$$\frac{1}{13} \cdot \frac{4}{52} = \frac{1}{170}$$



$P(21)$ 

10, A

A, 10

$$\frac{4}{13} \cdot \frac{16}{52} \cdot \frac{4}{51} = \frac{16}{663}$$

$$\frac{4}{52} \cdot \frac{16}{51} = \frac{16}{663}$$

$$\frac{32}{663}$$

For dependent events...

$$P(A, \text{ then } B) = P(A) \cdot P(B \text{ after } A)$$

Ex: You have a bag of 4 blue marbles, 5 red marbles, and 7 green marbles. If you pick a marble out of the bag, set it aside, and pick another, what is...

$$P(\text{blue, then red}) = \frac{4}{16} \cdot \frac{5}{15} = \frac{1}{12}$$

$$P(2 \text{ greens}) = \frac{7}{16} \cdot \frac{6}{15} = \frac{7}{40}$$

$$\frac{7}{16} \cdot \frac{6}{15} = \frac{42}{240}$$

Using the same marble bag...

1)  $P(2 \text{ reds}) =$

2)  $P(\text{red, then green}) =$

3)  $P(3 \text{ reds}) =$

4)  $P(4 \text{ blues}) =$

5)  $P(2 \text{ reds, then 3 greens}) =$

What is the probability of being dealt the following cards in a card game?

6)  $P(\text{A, then King}) =$

7)  $P(\text{pair of Kings}) =$

8)  $P(3 \text{ hearts}) =$

9)  $P(5 \text{ spades}) =$

10)  $P(3\text{-of-a-kind}) =$

1) P(2 reds) =

$$\frac{\overset{1}{\cancel{5}}}{\cancel{16} \underset{4}{}} \cdot \frac{\overset{1}{\cancel{4}}}{\cancel{15} \underset{3}{}} = \frac{1}{12}$$

2) P(red, then green) =

$$1 \cdot \frac{\cancel{5}}{16} \cdot \frac{7}{\cancel{5} \cdot 3} = \frac{7}{48}$$

3) P(3 reds) =

$$\frac{1}{4} \cdot \frac{3}{16} \cdot \frac{4}{15} \cdot \frac{3}{14}$$

$$\frac{1}{56}$$



4) P(4 blues) =

$$\frac{1}{4} \cdot \frac{1}{5} \cdot \frac{1}{7} \cdot \frac{1}{3}$$

The calculation shows the product of four fractions:  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{1}{7}$ , and  $\frac{1}{3}$ . The numerators are all 1, and the denominators are 4, 5, 7, and 3. Red lines are drawn through the numerators and denominators of the first three fractions, indicating cancellation. The final result is  $\frac{1}{1820}$ .

$$\frac{1}{1820}$$

5) P(2 reds, then 3 greens) =

$$\frac{1}{4} \cdot \frac{5}{6} \cdot \frac{4}{5} \cdot \frac{3}{4} \cdot \frac{2}{3} \cdot \frac{1}{2} = \frac{5}{624}$$

$$\frac{5}{624}$$

6)  $P(A, \text{ then King}) =$

$$\frac{1}{13} \cdot \frac{4}{51}$$

$$\frac{4}{663}$$

7) P(pair of Kings) =

$$\frac{1 \cdot \cancel{4}}{13 \cdot \cancel{52}} - \frac{\cancel{3} \cdot 1}{\cancel{51} \cdot 1} \Rightarrow = \frac{1}{221}$$

8) P(3 hearts) =

$$\frac{1}{4} \cdot \frac{13}{52} \cdot \frac{12}{51} \cdot \frac{11}{50}$$

$$\frac{11}{850}$$

9) P(5 spades) =

$$\frac{1}{1} \cdot \frac{13}{52} \cdot \frac{12}{51} \cdot \frac{11}{50} \cdot \frac{10}{49} \cdot \frac{9}{48}$$

$$\frac{33}{66640}$$

10) P(3-of-a-kind) =

$$\frac{1}{51} \cdot \frac{3}{50}$$

