



PROBABILITY OF COMPOUND EVENTS

Created for you by Mrs. Nhoisoubank

1. There are 12 picture cards (P), 20 red cards (R), and 20 black cards (B) in a deck. Aubrey and Gavin each randomly pick a card from the deck. Aubrey picks a card first before Gavin picks.

a. Determine whether the events in this situation is dependent or independent. dependent total
52

c. Find the probability that Aubrey and Gavin both pick picture cards.

$$\frac{P(P) \cdot P(P)}{13 \cdot 52} = \frac{11}{51} = \frac{33}{663} = \frac{11}{201}$$

d. Find the probability that Aubrey picks a red card and Gavin a black card, or vice versa.

$$P(R) \cdot P(B) \text{ or } P(B) \cdot P(R)$$

$$\frac{20}{52} \cdot \frac{20}{51} + \frac{20}{52} \cdot \frac{20}{51}$$

$$\frac{400}{2652} + \frac{400}{2652}$$

$$\frac{800}{2652} = \frac{200}{663}$$

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2. Chris and Ian play against each other in a game. The probability that Chris wins a particular game is 0.6. If Chris wins, the probability that he wins the next game is x . If Chris loses, the probability that he wins the next game is 0.5.

a. Determine whether the events in this situation is dependent or independent. dependent

b. Draw a tree diagram to the possible outcomes.

c. If the probability that Chris wins both games is 0.42, what is the value of x ?

$$\frac{0.6 \times x}{0.6} = \frac{0.42}{0.6}$$

$$x = 0.7$$

d. What is the probability that Ian wins both games?

$$P(I, I) = (0.4)(0.5) = 0.2$$

e. What is the probability that Ian wins at least one of the games?

$$P(C, I) \text{ or } P(I, C) \text{ or } P(I, I)$$

$$(0.6)(0.3) + (0.4)(0.5) + (0.4)(0.5)$$

$$0.18 + 0.20 + 0.20 = 0.58$$

3. There are 2 green party hats and 3 red party hats on a table. Steven randomly selects a party hat from the table. He tries the hat on, and then places it back on the table. He randomly selects another party hat.

a. Determine whether the events in this situation is dependent or independent. independent

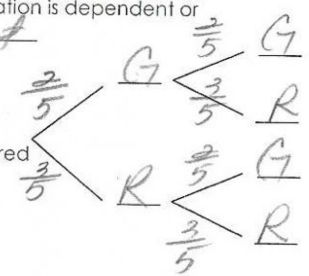
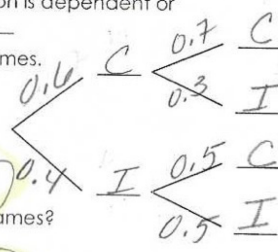
b. Draw a tree diagram to represent the possible outcomes.

c. Find the probability that Steven selects 2 red party hats.

$$P(R, R) = \frac{3}{5} \cdot \frac{3}{5} = \frac{9}{25}$$

d. Find the probability that Steven selects a red party hat after he first selects a green party hat.

$$P(G, R) = \frac{2}{5} \cdot \frac{3}{5} = \frac{6}{25}$$



4. A fruit basket contains 3 apples, 4 oranges, and 5 pears. Victoria and Lexi each randomly select a fruit from the basket.

a. Determine whether the events in this situation is dependent or independent. dependent

b. Draw a tree diagram to represent the outcomes.

c. Find the probability that Victoria selects an apple and Lexi selects a pear.

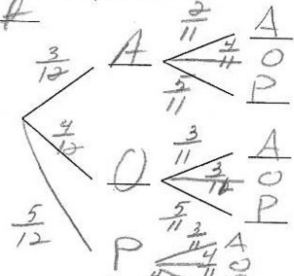
$$P(A, P) = \frac{3}{12} \cdot \frac{5}{11} = \frac{15}{44}$$

d. Find the probability that an orange is selected by either Victoria or Lexi.

$$P(A, O) + P(O, A) + P(O, P) + P(P, O)$$

$$\left(\frac{3}{12} \cdot \frac{4}{11}\right) + \left(\frac{4}{12} \cdot \frac{3}{11}\right) + \left(\frac{4}{12} \cdot \frac{5}{11}\right) + \left(\frac{5}{12} \cdot \frac{4}{11}\right)$$

$$\frac{12}{132} + \frac{12}{132} + \frac{20}{132} + \frac{20}{132} = \frac{64}{132} = \frac{16}{33}$$



5. A box contains 2 blue cards, 3 red cards, and 5 yellow cards. Tyler randomly selects a card from the box, and replaces it before he randomly selects again.

a. Determine whether the events in this situation is dependent or independent. independent

b. Draw a tree diagram to represent the possible outcomes.

c. Find the probability that he selects 2 red cards.

$$P(R, R) = \frac{3}{10} \cdot \frac{3}{10} = \frac{9}{100}$$

d. Find the probability that he selects a blue card, followed by a yellow card.

$$P(B, Y) = \frac{2}{10} \cdot \frac{5}{10} = \frac{1}{10}$$

e. Find the probability that he selects a yellow card, followed by a red card.

$$P(Y, R) = \frac{5}{10} \cdot \frac{3}{10} = \frac{15}{100} = \frac{3}{20}$$

