

Practice using Addition and Multiplication Rules

A box contains four tickets, with letters A, B, C, D.

1. Two draws will be made at random with replacement.

- (a) The things “the first draw results in the A” and “the second draw results in the B” are _____ and _____.

Fill in using one option from each pair below for each blank.

(independent, dependent) (mutually exclusive, not mutually exclusive)

The things “the first draw results in the A” and “the second draw results in the A” are _____ and _____.

Fill in using one option from each pair below for each blank.

(independent, dependent) (mutually exclusive, not mutually exclusive)

- (b) To get the probability that the ticket with the A is drawn first and the ticket with the B is drawn second (both of them happen), you would need to _____.

Choose one: (add, multiply).

Based on your first answer in part (a), conditional probabilities will be _____.

Choose one: (required, unnecessary).

Calculate the probability that the A is drawn first and the B is drawn second.

- (c) To get the probability that the ticket with the A is drawn first or the ticket with the A is drawn second or both (at least one of those two results happened), you _____ simply add two chances.

Choose one: (may, may not).

For this calculation, conditional probabilities are _____.

Choose one: (required, unnecessary).

The probability that the A is drawn first or the A is drawn second or both will be _____.

Choose one: ($\frac{1}{4} + \frac{1}{4}$, $\frac{1}{4} + \frac{1}{3}$, neither of those two).

If you chose ‘neither of those two,’ calculate the exact probability.

TURN OVER for PROBLEM 2

A box contains four tickets, with letters A, B, C, D.

2. Two draws will be made at random without replacement.

- (a) The things “the first draw results in the A” and “the second draw results in the B” are _____ and _____.

Fill in using one option from each pair below for each blank.

(independent, dependent) (mutually exclusive, not mutually exclusive)

The things “the first draw results in the A” and “the second draw results in the A” are _____ and _____.

Fill in using one option from each pair below for each blank.

(independent, dependent) (mutually exclusive, not mutually exclusive)

- (b) To get the probability that the ticket with the A is drawn first and the ticket with the B is drawn second (both of them happen), you would need to _____.

Choose one: (add, multiply).

Based on your first answer in part (a), conditional probabilities will be _____.

Choose one: (required, unnecessary).

Calculate the probability that the A is drawn first and the B is drawn second.

- (c) To get the probability that the ticket with the A is drawn first or the ticket with the A is drawn second or both (at least one of those two results happened), you consider simply adding two chances.

Which statement about such a simple method is correct?

- i. The correct answer cannot be found by adding two chances.
- ii. This addition may be used; one of the two chances added needs to be a conditional probability.
- iii. This addition may be used; neither of the two chances added should be a conditional probability.

The probability that the A is drawn first or the A is drawn second or both will be _____.

Choose one: $(\frac{1}{4} + \frac{1}{4}, \frac{1}{4} + \frac{1}{3}, \text{ neither of those two})$.

If you chose ‘neither of those two,’ calculate the exact probability.

Answers: 1.(a) indep, not ME; indep, not ME.

(b) mult, unnecessary, $(1/4)(1/4) = 1/16$, which is 6.25%.

(c) may not, unnecessary, neither of these two. $1 - (3/4)(3/4) = 7/16$, which is 43.75%.

2.(a) dependent, not ME; dependent, ME.

(b) multiply, required. $(1/4)(1/3) = 1/12$, which is $8\frac{1}{3}\%$.

(c) iii., $\frac{1}{4} + \frac{1}{4}$.