

10-7 Day 3

Objective: Understand mutually exclusive and inclusive events and calculate compound probabilities.

Feb 2-6:20 PM

Mutually Exclusive Events (Events that cannot happen at the same time)
No Overlaps $P(A \text{ or } B) = P(A) + P(B)$

Inclusive Events (Events that CAN happen at the same time)
Overlaps $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

Use sample spaces to determine the probabilities of mutually exclusive events and inclusive events.

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Let's Practice.....Find each probability when rolling a six-sided die.

List the Sample Space: 1 2 3 4 5 6

4a. $P(5) = \frac{1}{6}$ $P(2) = \frac{1}{6}$ $P(5 \text{ or } 2) = \frac{1}{6} + \frac{1}{6} = \frac{2}{6} = \frac{1}{3}$

b. $P(3) = \frac{1}{6}$ $P(\text{less than } 5) = \frac{4}{6} = \frac{2}{3}$ $P(3 \text{ or less than } 5) = \frac{1}{6} + \frac{4}{6} - \frac{1}{6} = \frac{4}{6}$

c. $P(\text{odd}) = \frac{3}{6}$ $P(\text{greater than } 2) = \frac{4}{6}$ $P(\text{odd or greater than } 2) = \frac{3}{6} + \frac{4}{6} - \frac{2}{6} = \frac{5}{6}$

d. $P(\text{prime}) = \frac{3}{6}$ $P(\text{even}) = \frac{3}{6}$ $P(\text{prime or even}) = \frac{3}{6} + \frac{3}{6} - \frac{1}{6} = \frac{5}{6}$

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Decide if the following events are Mutually Exclusive or Inclusive Events
 (basically do they have overlaps?)
 Then find the probabilities!!!

A die is rolled.

1. $P(1 \text{ or } 6) = \frac{1}{6} + \frac{1}{6} = \frac{2}{6} = \frac{1}{3}$

2. $P(\text{even or less than } 3) = \frac{2,4,6}{6} + \frac{1,2}{6} - \frac{2}{6} = \frac{4}{6} = \frac{2}{3}$

3. $P(\text{prime or a } 4) = \frac{2,3,5}{6} + \frac{4}{6} - \frac{4}{6} = \frac{4}{6} = \frac{2}{3}$

4. $P(\text{odd or greater than } 4) = \frac{1,3,5}{6} + \frac{5,6}{6} - \frac{5}{6} = \frac{4}{6} = \frac{2}{3}$

Feb 2-6:23 PM

Decide if the following events are Mutually Exclusive or Inclusive Events
 (basically do they have overlaps?)
 Then find the probabilities!!!

A card is selected from a standard deck of cards.

5. $P(10 \text{ or a diamond}) = \frac{4}{52} + \frac{13}{52} - \frac{1}{52} = \frac{16}{52} = \frac{4}{13}$

6. $P(\text{ace or } 8) = \frac{4}{52} + \frac{4}{52} = \frac{8}{52} = \frac{2}{13}$

7. $P(\text{spade or less than } 6) = \frac{13}{52} + \frac{20}{52} - \frac{5}{52} = \frac{28}{52} = \frac{7}{13}$

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The numbers 5-15 are written on pieces of paper and put into a bag. One piece of paper is drawn out of the bag.

List the sample space: 5 6 7 8 9 10 11 12 13 14 15

a. $P(\text{even or } 6) = \frac{5}{11} + \frac{1}{11} - \frac{1}{11} = \frac{5}{11}$



b. $P(\text{odd or less than } 12) = \frac{6}{11} + \frac{7}{11} - \frac{4}{11} = \frac{9}{11}$

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Assignment: 10-7 Day 3 Worksheet

The symbol \cup is sometimes used for the word OR and the
symbol \cap is sometimes used for the word AND.



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