

Unit 2 study Guide Answers

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2.1:

1) $S = \{a, b, c, d, e, f, g, h, i\}$ $A = \{a, b, c\}$ $B = \{a, f, g, h, i\}$ $C = \{d, g, i\}$

$A \cap B = \{a\}$

$A^c = \{d, e, f, g, h, i\}$

$A \cup B = \{a, b, c, f, g, h, i\}$

$C^c = \{a, b, c, e, f, h\}$

$B \cup C = \{a, d, f, g, h, i\}$

$A^c \cap B = \{f, g, h, i\}$

$C^c \cup A = \{a, b, c, e, f, h\}$

2) Rolling a dice

List event A rolling an even number = $\{2, 4, 6\}$

List event B rolling multiple of 3 = $\{3, 6\}$

$A \cup B = \{2, 3, 4, 6\}$

$A \cap B = \{6\}$

$A^c = \{1, 3, 5\}$

2.2:

1) Sample space $\{S1, S2, S3\}$

Simple events $\rightarrow \{S1\}, \{S2\}, \{S3\}$

2) An opinion poll is conducted with a group of voters (D, R, I), and if they are in a university (U) or are working (W). Give sample space and simple events.

Sample space - $\{(D, U), (D, W), (R, U), (R, W), (I, U), (I, W)\}$

Simple events - $\{D\}, \{R\}, \{I\}, \{U\}, \{W\}$

3) Evan tosses a coin 3 times, and called heads. Find

Probability distribution table

# of Heads	0	1	2	3
Probability	$1/8$	$3/8$	$3/8$	$1/8$

HHH TTT
HHT HTT
HTH THT
THH TTH

2.3:

1) If a card is drawn from a deck of cards, what is the probability of drawing a Jack, Spade, or Ace?

$$\text{Jack} = \frac{4}{52} - \left(\frac{1}{52}\right)$$

$$\text{Ace} = \frac{4}{52} - \left(\frac{1}{52}\right)$$

$$\text{Spade} = \frac{13}{52}$$

$$\frac{19}{52}$$

2) A card is drawn from deck of cards. What is probability of not drawing a Jack? Spade? ace?

$$\text{Jack} = \frac{48}{52}$$

$$\text{Ace} = \frac{48}{52}$$

$$\text{Spade} = \frac{39}{52}$$

2.4:

1) Three marbles are selected at random without replacement from a jar with 3 black, 2 white, and 3 red marbles. Find the probability that...

a) all 3 marbles are black

b) one is white and 2 are red

$$\frac{3}{8} \cdot \frac{2}{7} \cdot \frac{1}{6} = \frac{.0179}{}$$

$$\frac{2}{8} \cdot \frac{2}{7} \cdot \frac{1}{6} = \frac{.0119}{}$$

2) Kennadi is studying for a spelling bee and knows the meanings of 20 words from a list of 30. If the test has 10 words, find the probability that the student will score at least an 80.

$$\frac{20C8 \cdot 10C2}{30C10} + \frac{20C9 \cdot 10C1}{30C10} + \frac{20C10}{30C10} \approx \frac{.2507}{}$$

3) Assuming that the probability of a boy being born is the same as the probability of a girl being born, find the probability that a family of 4 children will have 2 boys.

BBBB, BBGG, BBGG, BGGG, GGGG
 BBGB, GGBB, GBGG
 BGGB, BGBG, GGBG
 GBBB, GBGB, GGBB

$\frac{3}{8}$

$\frac{1}{16}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{4}$ $\frac{1}{16}$
 BGGG GBBB
 4 3 2 1 0

2.5

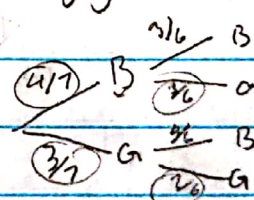
1.) Three marbles are drawn from a bag without replacement.

The bag contains 4 black & 3 grey marbles. Find the probability that:

a) The first marble is black $= \frac{4}{7}$

b) The second marble is black if the first is not grey $\frac{3}{6} = \frac{1}{2}$

c) The second marble is grey $\frac{3}{7}$



$4 \cdot \frac{3}{6} = \frac{12}{12}$

$3 \cdot \frac{2}{5} = \frac{6}{5}$

$\frac{19}{12} = \frac{4}{21}$

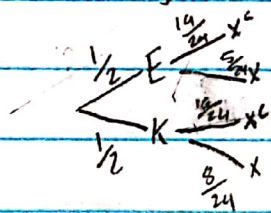
2.) In a box of 48 AAA batteries, 24 are Energy Ultimate Lithium Batteries (EULB) + 24 are Kirkland Signature Alkaline Batteries (KSAB) 5 of the Energy Ultimate Batteries are dead, while 8 of the Kirkland Signature batteries are dead. Find the probability: if E = event of drawing an EULB, K = event of drawing an KSAB, and X = event of drawing a dead battery.

a) $P(E) = \frac{1}{2}$

b) $P(X|E) = \frac{5}{24}$

c) $P(X|K) = \frac{1}{6}$

d) $P(X) = \frac{13}{48}$



$\frac{1}{2} \cdot \frac{5}{24} = \frac{5}{48}$ $\frac{13}{48} \times \frac{1}{2} =$

$\frac{1}{2} \cdot \frac{8}{24} = \frac{8}{48} \rightarrow \frac{1}{6}$

$\frac{13}{48}$

2.6

1. A store stocks teddy bears from 3 suppliers. Suppliers A, B, C supply 10%, 30% + 60% of the stuffed pink bears respectively. 1% of A, 7% of B, and 5% of company C's bears are unstuffed. If a bear is selected at random + found to be unstuffed, what is the probability that it came from supplier B?

S - event of stuffed

S^c - event of unstuffed

