

Assignment 31

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1

(a)

$$\frac{1}{6}$$

(b) *The set of all possible combinations for $X_1 + X_2 = 7$ is*

$$[1, 6], [2, 5], [3, 4], [4, 3], [5, 2], [6, 1]$$

Since there are six possibilities out of the 36 possible outcomes for rolling a dice, the probability of $X_1 + X_2 = 7$ is $\frac{1}{6}$

(c) *The probability that $X_1 \neq 2$ is $\frac{5}{6}$ and the probability that $X_2 \geq 4$ is $\frac{1}{2}$ since 4, 5, 6 are possibilities out of 6.*

$$\frac{5}{6} * \frac{1}{2} = \frac{5}{12}$$

2

(a)

$$P(A \cap B) = 0.4 + 0.7 - 0.9 = 0.2$$

(b)

$$P(A^c \cap B) = 0.5$$

(c)

$$P(A - B) = 0.4 - 0.2 = 0.2$$

(d)

$$P(A^c - B) = 0.6 - 0.5 = 0.1$$

(e)

$$P(A^c \cup B) = 0.1 + 0.5 = 0.6$$

(f)

$$P(A^c \cap B) = 0.2$$

3

$$\frac{20}{k!(20-k)!} * \left(\frac{3}{10}\right)^k * \left(\frac{7}{10}\right)^{20-k}$$

4

$$\frac{\frac{30}{k!(30-k)!} * \frac{70}{(20-k)!(50+k)!}}{\frac{100!}{20!80!}}$$