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$$1) n(s) = {}^{52}C_3 = \frac{52 \times 51 \times 50}{3 \times 2 \times 1} = 88,400$$

$$= {}^{13}C_1 \times {}^{13}C_1 \times {}^{13}C_1 = \left(\frac{13!}{1!12!}\right) \times \left(\frac{13!}{1!12!}\right) \times \left(\frac{13!}{1!12!}\right)$$

$$= 13 \times 13 \times 13 = 2197$$

$$= 2197$$

$$P(E) = \frac{n(E)}{n(s)} = \frac{2197}{88400} = \frac{169}{6800}$$

2) Action Movies = 42% $\rightarrow P(A)$

Comedy Movies = 54% $\rightarrow P(B)$

Drama Movies = 36% $\rightarrow P(C)$

Horror Movies = 12% $\rightarrow P(D)$

$$a) P(A \cup C) = P(A) + P(C) - P(A \cap C)$$

$$= 42 + 36 - 0$$

$$P(A \cup C) = \frac{78}{100}$$

$$b) P(B \cup D) = P(B) + P(D) - P(B \cap D)$$

$$= \frac{54}{100} + \frac{12}{100} - 0 = \frac{66}{100}$$

3)

Bag A

Bag B

Red = 3

White = 4

Black = 5

Black = 7

$$P(A) = 1/2$$

$$P(B) = 1/2$$

$$P\left(\frac{\text{Black}}{A}\right) = 5/8, \quad P\left(\frac{\text{Black}}{B}\right) = 7/11$$

$$P\left(\frac{B}{\text{Black}}\right) = \frac{P(B) \times P\left(\frac{\text{Black}}{B}\right)}{P(A) \times P\left(\frac{\text{Black}}{A}\right) + P(B) \times P\left(\frac{\text{Black}}{B}\right)}$$

$$= \frac{1/2 \times 7/11}{[1/2 \times 5/8] + [1/2 \times 7/11]}$$

$$= \frac{7/22}{5/16 + 7/22} = \frac{7/22}{\frac{110 + 112}{352}} = \frac{7/22}{222/352} = 7/22 \times \frac{352}{222}$$

$$= \frac{2464}{4884}$$

a) $\lambda = \frac{450}{60}$

$$\lambda = 15/2, \quad x = 10$$

$$P(X=x) = \frac{e^{-15/2} \cdot \left(\frac{15}{2}\right)^{10}}{10!}$$

$$= 0.0868$$

b)

$$P(X=x) = \frac{e^{-15/2} \cdot (15/2)^{17}}{17!}$$

$$b) \quad Z = \frac{Y - \mu}{\sigma}$$

$$0.675 = \frac{Y - 350870}{12405}$$

$$Y = 350870 + (0.675 \times 12405)$$

$$Y = 359237.045.$$

$$75 \text{ percentile} = 359237.045.$$