1) Total no. of cards = 52

  No. of diamond cards = 13

  No. of heart card = 13

  No. of spade card = 13

  A card drawn without replacement

$$= \frac{13}{52} \times \frac{13}{51} \times \frac{13}{50} = \frac{2197}{132600}$$

$$= 0.25 \times 0.25 \times 0.26$$

$$= 0.01625$$

2) Percentage = 100

Like action movies = 42%

Like comedy movies = 54%

Like drama movies = 36%

Like horror movies = 12%

a) Movie type is either action or drama

$$= \frac{42}{100} + \frac{36}{100}$$

$$= \frac{78}{100} = 0.78$$

b) Movie type is either comedy or horror

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

$$= 0.66$$

3) A → 3 red, 5 black

B → 4 white, 7 black

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

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

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

$$= \frac{7/22}{0.630}$$

$$= 0.505$$

6) $\mu = 350870$

$\sigma = 12405$

$Z = 75 \Rightarrow 0.675$

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

$\qquad\qquad = 359,243.375 \qquad [\because \mu + \sigma z]$