

$$34. a. {}_{25}C_5 = \frac{25!}{5! \cdot (25-5)!} = \frac{25!}{5! \cdot 20!} = 53,130$$

$$b. \binom{6}{2} \binom{19}{3} = \frac{6!}{2! \cdot (6-2)!} \cdot \frac{19!}{3! \cdot (19-3)!} = 14,535$$

$$c. \binom{19}{4} \binom{6}{1} = \frac{19!}{4! \cdot (19-4)!} \cdot \frac{6!}{1! \cdot (6-1)!} = 23,256$$

$$\binom{19}{5} \binom{6}{0} = \frac{19!}{5! \cdot (19-5)!} \times 1 = 11,628$$

$$N(A) = \binom{19}{4} \binom{6}{1} + \binom{19}{5} \binom{6}{0} = 23,256 + 11,628 = 34,884$$

$$P(A) = \frac{N(A)}{N} = \frac{34,884}{53,130} = \boxed{0.6566}$$

48.

$$a. P(A_2 | A_1) = \frac{P(A_1 \cap A_2)}{P(A_1)} = \frac{0.06}{.12} = .5$$

$$b. P(A_1 \cap A_2 \cap A_3 | A_1) = \frac{P(A_1 \cap A_2 \cap A_3)}{P(A_1)} = \frac{0.01}{.12} = \boxed{0.0833}$$

$$c. \frac{P(A_1 \cap A_2 \cap A_3)}{P(A_1 \cup A_2 \cup A_3)} + \frac{P(A_1 \cap A_2 \cap A_3)}{P(A_1 \cup A_2 \cup A_3)} + \frac{P(A_1 \cap A_2 \cap A_3)}{P(A_1 \cap A_2 \cap A_3)}$$

$$= \frac{0.04}{0.14} + \frac{0}{0.14} + \frac{0.01}{0.14} = \frac{0.05}{0.14} = 0.357$$

$$d. \frac{P(A_1 \cap A_2 \cap A_3)}{P(A_1 \cap A_2)} = 1 - \frac{P(A_1 \cap A_2 \cap A_3)}{P(A_1 \cap A_2)}$$

$$1 - \frac{0.01}{0.06} = \boxed{0.8333}$$